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Johnstons'

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JOHNSTONS'

Dental Miscellany.

VOL. V.——*JANUARY, 1878.*——No. 49.

HISTORY OF ARTIFICIAL VELA.

By N. W. KINGSLEY.

The history of artificial vela begins with M. Delabarre. In a former article I made a distinction between obturators and artificial vela, which must be kept in mind.

The definite history of obturators goes back more than three hundred years, while that of artificial vela scarcely more than fifty ; due, possibly, to the fact that there was no suitable material known, prior to the discovery of caoutchouc, of which a substitute for the natural palate could be made. M. Delabarre was, in all probability, the first one who conceived and put into practical use a soft, flexible, elastic valve, which would fulfill to any degree the functions of a natural velum.

The case was one of syphilitic origin of extensive character. The entire roof of the mouth and soft palate had been carried away, together with nearly all the teeth, necessitating a formidable apparatus, which was a combination of denture, obturator and velum. The denture was made of mineral teeth mounted on a platinum base, and sustained *in situ* by a spring connecting with a skeleton frame resting upon the lower teeth; restoring, to a certain degree, the form of the lost structures, and not unlike, in its general contour, to the full upper denture of the present day. To the posterior edge of this denture he attached a velum and uvula of "gomme elastique" (India-rubber).

In reading M. Delabarre's account of this apparatus, he seems to have been more anxious to conserve deglutition than to restore the articulation of the voice. To this end he devised a valve in the anterior part of his denture, which, by a system of compound levers, was connected on the superior surface with the velum and uvula, and operated by pressure of the forward part of the tongue.

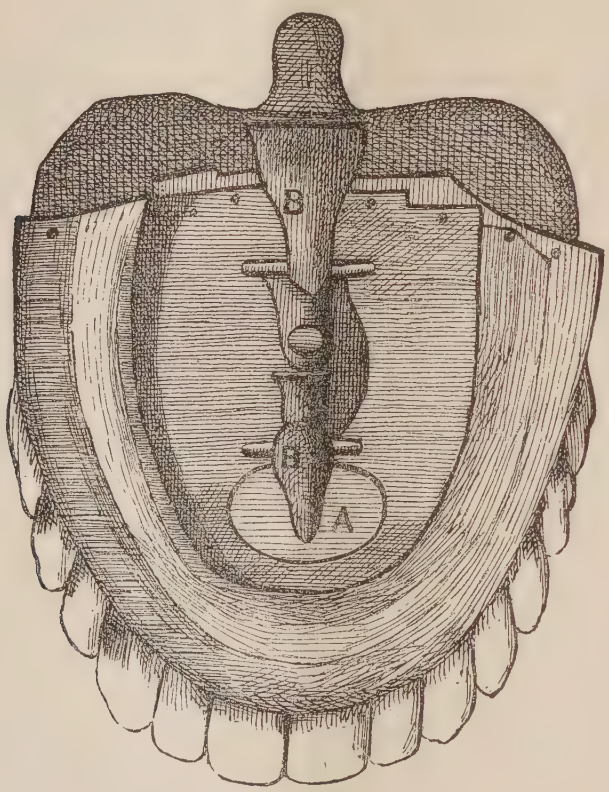


FIG. 1.

Fig. 1, copied from Delabarre's treatise, illustrates the instrument. A, shows the valve in the roof, which raised up on pressure from below and was returned by a light spring. BB indicates two levers hung in the middle upon axes; the anterior end of the first attached to the valve, and the posterior end of the second attached to the velum and uvula, so arranged that the motion of lifting the valve would be communicated to the velum and elevate that also. This "machine," as Delabarre calls it (the term being singularly appropriate when transferred to English), could only be operated by the tongue in a certain position, and therefore the machinery could not have been of any advantage in articulation, although Delabarre claims that the whole apparatus was of great benefit to the patient in mastication, in deglutition, and "for the articulation of words." In the light of modern science we cannot regard the

machinery as of any advantage; the velum would, in all probability, have contributed an equal benefit without it. Such a complicated apparatus would be likely to become easily disarranged, and not of a very permanent character; therefore it is not surprising that we find no record of any attempt to make an application of it to other cases.

The object of this detailed description is rather to give a clear understanding of the first attempt to make an artificial velum. Granting that this experiment of Delabarre's was a complete success, its importance must not be overrated. The case was one of accidental lesion; and later experience has shown that a very simple, and often a very crude appliance, will restore articulation to one who formerly possessed that function. Nevertheless, to him must be accorded the credit of the first conception and practical application of the only material which could be adapted to a velum; and although the caoutchouc of that day was a very perishable material, compared with the same substance as improved by vulcanization, his experiment laid the foundation of successful artificial vela, and, in all probability, encouraged Mr. Snell, of London, in his experiments, made shortly after, and for which he claims complete success.

Mr. Snell makes the date of his construction of an artificial velum about 1823, and this is the first record I have been able to find of any effort to remedy the evils of *congenital fissure* of the palate by mechanism.

All appliances made prior to that time were for accidental lesions, and congenital cases were considered as hopeless except by surgery, and even at that date the era of staphyloraphy was just dawning.

His first case was that of a young lady with fissure of both hard and soft palate along the median line, which does not appear in the record to have been complicated with harelip. He "obtained a correct model of the defective parts, from which a gold plate was formed to fit the roof of the mouth, reaching as far back as could be worn by the patient, to the posterior part of which two pieces or flaps of India-rubber were attached, thus filling up the deficiency of the soft palate. A small movable piece of the same material was also attached, by means of a gold hinge, to the centre of the lower piece, to imitate, as near as possible, the natural uvula.

"A piece of ivory was next fitted to the upper or back part of the gold plate, and carried upwards until it came in contact with the remaining part of the septum narium; this was, of course, firmly attached. The whole was held in its situation by means of two gold springs soldered to the plate, which were fixed round one of the molars on each side."

Mr. Snell shows, in his treatise, that the principal object which he desired to attain was an improved articulation of the voice, and for the above instrument he claims most satisfactory results.

In an improved appliance which he made subsequently, "the piece of prepared elastic gum is attached to the posterior part of the plate, where the natural soft palate commences, extending downward on each side as low as the remaining part of the uvula, and grooved at its lateral edges to receive the fissured portions of the velum. A movable velum is placed in the posterior centre of the elastic gum. That these may partake of the natural movements of the parts during deglutition, a spring is affixed behind them, one end of which is fastened to the posterior and anterior surfaces of the principal plate, and the other end rests gently against the posterior face of the India-rubber; this keeps it always in close apposition with the edges of the fissure during deglutition."

It is much to be regretted that there is no engraving of this instrument; but from a careful reading of this last quotation, I am inclined to the opinion that it describes a velum of triple form, which was not unlike in principle to the one introduced by Dr. Stearn, in America, twenty years later. (See Fig. 2.)

Dr. Stearn's experiments mark a distinct epoch in the history of artificial vela—not so much from a better understanding of the requirements in such cases, nor from a superiority of skill in the adaptation of an apparatus, as from the accidental good fortune of having brought to his notice the best substance which has yet been discovered for this purpose.

It was in 1841 or 1842 that Dr. Stearn, a young graduate in medicine, and a native of Springfield, Massachusetts, where he was then residing, became acquainted with Mr. Goodyear, who was then conducting his experiments in combining sulphur with rubber to improve it. Dr. Stearn was afflicted with a congenital cleft palate, the fissure being confined almost exclusively to the soft palate.

He had been twice or thrice operated upon surgically, but in each instance staphyloraphy proved a failure, and his only hope of benefit lay in mechanism. Being naturally of an ingenious mind, and acquainted with the improvements in rubber, he gave his attention to the construction of an artificial velum for himself.

When it is considered that he was without any practical knowledge of mechanical dentistry, and did not, and could not, make such a model of the parts as is now considered essential, and that all his efforts were tentative upon himself, the results were marvelous.

He then demonstrated that a very formidable apparatus could be in-

troduced within the pharynx, and worn with comfort, and with it articulate speech could be perfectly acquired.

More than fifteen years after this I came to know Dr. Stearn, and his voice, articulation and enunciation were so clear and distinct, that but few would have suspected the deformity without an anatomical examination.

Like most other pioneers in great inventions, Dr. Stearn arrived at the result by the most complicated means. His instrument, which will be described and shown hereafter, was a marvel of ingenuity, and the process by which it was made, in the light of modern simplicity, was an undertaking of some magnitude. Instead of the more scientific plan, as now used, of obtaining an accurate cast of all the parts involved, and to such a cast adapting an instrument, and afterward making a metallic mould in which to produce the rubber duplicates, he began his work by *carving* a mould out of wood, in which to vulcanize the velum.

To obtain some idea of the form to be given to the mould so that the resultant casting should fit the fissure, he took small impressions of various parts with soft wax attached to the end of a bent stick, and copied the forms thus ascertained in his wooden mould. Encouraged by the approval of distinguished surgeons in this country, he visited London and Paris in 1845, and contributed a valuable article upon the subject to the London *Lancet.*

His instrument and his ingenuity were much admired, but it is evident that its complexity carried the idea pretty generally that it was not of universal application, as we find that the little interest it awakened soon died out, and the few efforts made by dentists to adopt it were abandoned, and in a few years it was unknown to the mass of the profession, and only remembered by the few as a brilliant exceptional effort.

Figures 2 and 3 are representations of the two sides of the Stearn instrument; 2 shows the oral side, and 3 shows the nasal or pharyngeal surface of the same instrument.

In 2, *m m* shows a portion of gold plate which continued on the side of the ragged edge until it was clasped to teeth on each side of the mouth. The remnant of the natural palate filled the groove marked *g g*.

The broad lower edge, as seen in the engraving, hung in the pharynx, and provision was made for the approximation of the sides of the fissure and for other contractile muscular action by slitting the body of the instrument up the middle, and to permit sound escaping through the slit, the valve or flap, marked *v l v*, covered it.

The action of the artificial velum, when subject to muscular move-

ment, would be, that the sides marked *g g* would lap over and slide upon each other in the act of deglutition so easily and readily as not to irritate the surrounding structures.

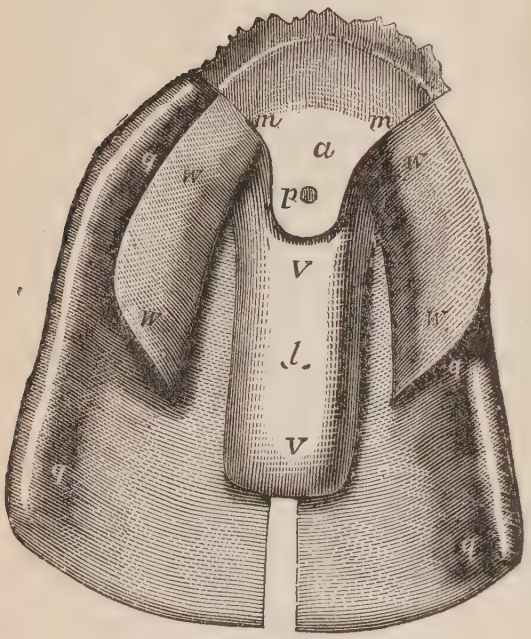


Fig. 2.

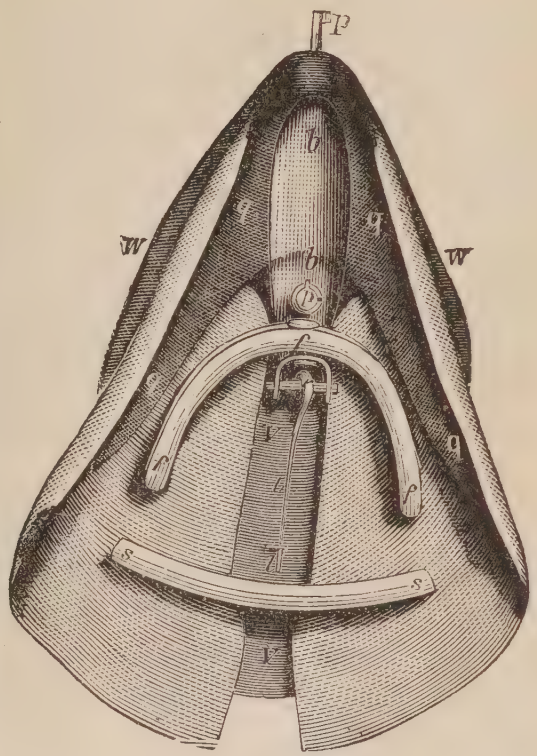


Fig. 3.

Owing to the instability of the rubber, and particularly after it had been worn a short time, it became necessary to give extra support to the valve, so that it should be retained firmly against the body of the instrument; and a gold spring was arranged, as shown upon the other side of the appliance in Fig. 3, at the letter *f*. The curved bands, marked *f f f* and *s s*, were of rubber homogeneous with the piece, and introduced to give stability and fill out the velum when contractile muscular power was relaxed. The aforementioned valve was not intended, in any sense, to represent the uvula, which its appearance and locality may suggest, but was a necessary result of the division of the instrument along the centre.

It was with much satisfaction that Dr. Stearn viewed this trifold character of his instrument, regarding this method of providing for the contraction of the surrounding muscles as a triumph of skill.

To quote his own language in 1860, "I wish to be understood as saying, in exact terms, that I consider the slit and opening through the centre, and its closure by a sort of valve on the anterior surface, as an essential feature of all artificial vela; and also that I do not acknowledge

the remotest obligation to any other person for this one idea; and which did not present itself to my mind until I had occupied myself with my first case (in '41 and '42) for more than a year. * * * * *

"Eighteen years have since elapsed, and I have not yet conceived any other possible way of constructing an instrument at once simple, delicate and durable, than in this *triple* form; and though I trust and believe that others will hereafter improve upon my methods, I am confident that this one feature will be preserved in all successful 'obturators.'"

An important principle, enunciated by Dr. Stearn as essential to the success of all artificial vela for congenital cleft, was, that the instrument filling the fissure in the natural palate must be of the nature of a valve, under the control of the muscles surrounding it, and so arranged that it could be elevated by them, and thus the nasal passage shut off, as is absolutely essential in the production of certain sounds belonging to articulate language.

This principle was carried out by him, first, in the chracter of the material chosen being of a yielding, elastic nature; and second, in the form, being made to embrace the levator muscles and subject to their control.

ETUDE SUR LA GREFFE DENTAIRE.

Par Le Docteur Th. David.

(Continued.)

The Greffe by Restitution.

§I. *Historical.*

This operation is better known in dental surgery under the name of "re-implantation," or "replantation."

As we have already said, Hippocrates seemed to know of it. But to Pierre Dupont belongs the honor of having first surgically practiced it.

The fact which he reports relates to a decayed tooth, which ached most violently. Dupont, acceding to the request of his patient, decided to extract it; then he conceived the idea of replacing it in its alveolus, where it reunited perfectly. He did not stop with this one trial. Delighted with the result, he established this operation in the way of treatment, with the aim of intercepting the nervous fibres of the teeth, and of

preventing the latter from ever aching (1633). Several years later this operation is several times mentioned in a book which appeared anonymously in Geneva (1670). The second fact, published with guarantees of authenticity, was that of Dion Pomaret (1694).

This time it relates to a tooth which, having been pulled out by mistake during the extraction of a neighboring tooth, was immediately replaced, and became as firm as ever.

Since then, the "re-implantation" seems to have been perfectly acquired by science and practice. It is recommended by Schelhammer, by Fischer (1726), Mouton (1744), L'Eclure (1755), Pfaff (1756), Bourdet (1757), Jourdain (1761), and, above all, by Fauchard (1786), who all seem to have practiced it, as a rule, either to deaden the sensibilities of a decayed tooth, or as a help in difficult "operations." The last-named author has reported five observations, which are followed by very interesting comments upon the inflammatory symptoms which may accompany the operation. He speaks in very precise terms of the *periostitis* which may come to complicate it. His authority had a great influence upon the practice of his contemporaries, who have even gone so far as to attribute to him the priority of the re-implantation. In reality, if he was not its inventor, he was, at least, its godfather.

"I have undertaken," says Leclure, "to perform this operation upon more than 300 soldiers in Flanders. I have also performed it upon 80 or more poor people. All these teeth are living, without causing the least pain; upon the eighth day they were so firmly fixed, that they cooperated with the functions of the others."

Bourdet also reports very interesting observations of re-implantations, some of which we shall quote farther on.

At a period not so far distant from us, the *greffe* by restitution found many supporters. For example: Meyer Lewis (1772), Brunner (1766), Hunter (1780), Wooffendale (1783), Blumenbach (1786), Calliseu (1794), Richter (1797), Ettmüller (1798), Arnemann (1802), Benjamin Bell (1806), Galette (1813), Wiesemann (1824), Linderer (1834), Lomnitz (1840), Twist (1842), Fraury (1848), Joux (1851), Alquié (1860), Jaft (1860), Coleman Lyons (1860), Mitscherlich (1864), Magitot (1865–1876), Dop (1876).

In spite of the authority of many of these names which we have quoted, doubts have at all times been raised as to the possibility of *re-implantation.* The first author who would not admit its feasibility was Dionis (1707), whose authority enabled him to withstand the distrust of most of the physicians in respect to this operation.

Portal (1767), Thomas Budmore (1770), Courtois (1775), Laforque (1802), Serre (1804), Garriot (1806), Henri Bass (1728), Oudet (1835), without absolutely denying that a replanted tooth might become solidly fixed, contested the value of the results obtained. They said that the operation was followed by inflammatory troubles, complications inducing maxillary necrosis, *fistules*, etc.

The words and writings of these authors certainly had great weight, for re-implantation was little by little forgotten in France from the beginning of our century. The contemporary specialists spoke of it only to combat it. Then Mr. Magitot, whose doubts are *now* ended, wrote, in 1865, in the General Archives of Medicine:

"The difficulties encountered in the efforts to restore healthy teeth, are not likely to remove the incredulity which we feel in regard to the replanting of decayed teeth."

But, to shorten such a long and tiresome account, the researches which we have made on this subject have shown us:

1st. That if replanting has, since the beginning of the century, been rather neglected, in more ancient times it was much in vogue.

2d. Its supporters are more numerous than its adversaries.

3d. It has often been practiced with success, as the numerous observations reported by the different authors show, and, though rarely, it is true, it is proved that it has lasted many years. (Bourdet, 10 years; Taft, 16 years.)

§II. *Indications—counter*-indications.

The *greffe* by restitution finds its indications in—

1. Luxation.
2. Decay.
3. The alveolar periostitis.

A. *Luxation.*

This, of all the indications, is the one upon which authors are the least divided. All of them, when a sound tooth has been extracted by mistake, advise putting it back in its place, in order to see if it will reunite.

The counter-indications to this practice would seem to us to be, 1st. The prolonged duration of the isolation; 2d. Much disorder on the side of the dental periosteum, and on the side of the alveolus.

B. *Decay.*

The principal and only symptom which one is ever called to combat during the course of this trouble, is pain. One can almost always at-

tain the desired end by using the means which are generally employed for the purpose of destroying the pulp at once. (We do not speak, here, of the decays which do not penetrate, and which are easier to treat.)

It sometimes happens that even the most skillful hand is unable to place the *caustic* on the *loco-dolendi*, either because the decayed part is awkwardly situated, and the *hole of penetration* is narrow; or else from the indocility of the patient, who will not lend himself to any operations. When, in these cases, where extraction is usually urgently besought, the pain needs to be stopped, we think that the tooth should be extracted and then replanted. If the decay is so situated that stopping would be easy, one could, following the example of many practitioners, and a method much used by Americans, simply loosen the tooth incompletely, in such a way as to break the pulp connections, still letting it adhere to the gum. As the stopping of the *pathological* cavity is difficult to perform *in situ*, and the chances of success less than in an operation upon a tooth with a sound root presents, it is preferable to take the tooth completely out, and fill it out of the mouth. It does not suffice to have treated the painful symptom; one must consider the importance of a good stopping in preserving, for the longest time possible, the integrity of the ailing organ, and take away from it all the causes of *periostitis* to which the penetrating decay is the opening.

There are even cases where (pain being out of the question) the preservation of the tooth depends upon the *re-implantation.* Considering this aspect of the case, Bourdet insists upon the *atérales caries* of the front teeth, when it is very difficult to make operations which shall be at the same time concealed and durable, and he advises the *greffe*, in order to fill the tooth out of the mouth, where it can be done much better. With the knowledge that we have of the results and chances of success of re-implantations, we are not opposed to this idea; we are even convinced that when its methodical rules are once established, it will constitute a useful mode of treatment.

To sum up: in case of caries of the teeth, the *greffe* by restitution must be tried when the extraction has been done, to destroy the pulp, which cannot be seized by ordinary means, or to perform out of the mouth an operation which is impracticable when the tooth is in its place.

The counter-indications of the re-implantations when there is decay are: 1st. The possibility of interfering otherwise, arriving at the same results. 2d. The bad state of the tooth. 3d. Finally, too great disorders produced during extraction, either on the tooth or in the alveolar cavity.

C. *Periodontitis.*

The two preceding indications have been well laid hold of by our predecessors. That is not the case with the one relating to the "periostitis dental alveolo," an affection which the greater number of authors have regarded as a certain cause of failure. "As to teeth with ailing roots," says Mitscherlich, "it will always be necessary to extract them, and they should never be re-implanted. We can prove, in fact, that such an attempt would never succeed."

According to our historical researches, Hunter is the first who has ever mentioned the possibility of re-implantation where periostitis pre-exists. In very exact terms, he not only describes the operation, as it was performed by Alquié, Coleman, Lyons and Mr. Magitot, but also the injuries which cause it (or rendered it necessary). About gum-boils—that is to say, abscess discharging through the gums, accompanied by a dental *alteration* (from good to bad)—he says: (1.) "When you extract an ailing tooth, you will generally find it injured at its *point*, or thereabouts. Here the surface will be uneven and rough, and will resemble a bony surface on the way to ulceration. Extracting the tooth, filing away the diseased parts, and replacing it immediately has been tried; but in many cases this practice has not been followed with the desired success, because it often happens that the tooth has been replaced in a diseased jaw. Nevertheless, this method has sometimes succeeded." But he neither quotes nor reports any *fact* to the point. The first known observation upon this subject is that of Alquié, whom chance and curiosity threw in the way of the operation. Yet Bourdet performed a re-implantation, preceded by the *resection* of a part of the root, long before the Professor de Montpellier. We must add, however, that he had not the treatment of periostitis in view. However that may be, the operation indicated by Hunter, and performed by Alquié, had been forgotten, when it was taken into consideration by Coleman and Lyons, and more recently by Mr. Magitot. To the latter belongs the honor of having practiced it the oftenest, and of having established exact rules in regard to it. Three of his observations have already appeared in the *Hospital Gazette* of 1876. While awaiting the publication of more, to the number of thirty, our master has generously authorized us to make the results known, and even to publish some of them complete, which we shall do later on.

We trust that you will pardon us for stopping such a length of time at this point of our subject, which is at the same time the most interesting and most *surgical* part, as it were, and also the one into which we have studied the most. From a practical point of view, the operation

of Alquié permits us to cure quite serious affections of the maxillary bones, while preserving the dental apparatus, which was the starting-point. Let us now see to what forms of periostitis this method of treatment can be applied.

The acute periostitis terminates by *resolution*, or by passing to a chronic state, either with or without abscess, placing itself then at the summit of the root. The usual effect of this *localization* is to unfasten (*unglue, literally*) the dental periosteum to a certain extent, to destroy it, and thus to leave the top of the root bare in the alveolus. This root, sometimes *hypertrophied*, oftener worn away, re-absorbed, as Hunter has said, is like a foreign body at the bottom of the alveolus. There, in time, it induces bony *alterations*, which in most cases produce an abscess whose *mucous* or *cutaneous* opening remains *fistulous* from the *persistence* of the initial cause, the dental sequestrum. The fact is, that this part of the root, stripped of its periosteum, or nourishing membrane, is deprived of life, and acts exactly as do the *sequestræ* in bony affections.

It is, then, rational in this case to apply the same treatment as in *necrosis* of the bone. Only the removal of the ailing part cannot be performed in its place, as the surgeons perform it daily upon different parts of the *skeleton!* Here we must isolate the diseased organ; and with the help of extraction one can separate the *alterated* part. This is one of the consequences of the anatomical situation of the tooth, and the seat of the *necrosed* affection. Thus, in the operation of Alquié, as we have seen, it is a simple *resection;* but, in order to effect it and preserve the organ, one must, after the resection, profit by the property which the tooth possesses of regaining life by the *greffe.*

We have already seen, in connection with decay, that extraction and re-implantation are only secondary operations, performed with a view to another—either filling or the destruction of the pulp.

But in the resection of the summit of the dental root, you must take away all the diseased part. This may be more or less large, a consideration which is of importance to the success of the re-implantation. We have already said, above, that a replanted tooth will resume its functions more certainly when the surface of the root connected with the sound periosteum is large. If, then, the *necrosis* of the adjacent parts is large, the chances of success will be diminished.

After the resection there generally remains a *mauchose* (literally, *muff*, collar) of periosteum, which suffices to make the tooth adhere in such a way as to secure its solidity. In one of Mr. Magitot's cases, relating to an inferior wisdom-tooth, they had to cut more than half of the root, so that

the part which remained was very small. The consolidation was, however, accomplished, although more slowly than in the other cases.

It would seem, *à priori*, that in order to have the tooth take root again, there ought to be, near the neck of the tooth, a complete ring of healthy periosteum. This condition is not absolutely necessary. Certain points may remain without contracting any adherence; nor does it follow that for this reason an *eliminating suppuration* will set in. On this subject Bourdet reports a fact which is as interesting as it is curious. He wished to straighten an upper incisor which had deviated from its axis. He extracted it, in order to re-implant it in its normal position. The summit of the root being bent, it was necessary to cut it, in order to place the tooth in a different situation. The body of the root was much flattened, so that, in order to give the organ the desired position, they were obliged to file one of the edges of the root in all its length. This is the first example which we have of re-implantation performed with success after the resection of the root—that is to say, after the destruction, in part, of the periosteum.

It is certain that a diminution of the extent of the periosteum cannot exceed a certain limit without endangering the success of the *greffe*. In one of the two cases of Mr. Magitot which failed, the destruction was very considerable—two-thirds of the implanted root were not covered with periosteum. In its relations to periostitis, the re-implantation may have other counter-indications besides those already mentioned in connection with luxation and decay. They are: a too great destruction in the extent of the periosteum, the *alteration* of the remaining part, or any serious injuries of the bone. In the two first cases, one risks failure from the counter-indications. In the third case, in addition, it is more reasonable to leave the alveolus open, in order to facilitate the elimination of the affected parts of the bone, and not to let it occur in any other way.

§III. *Manual Operation.*

It is not our intention to describe minutely here the manual work of the divers ways of practicing the *greffe* by restitution. The best description would add nothing to the idea which one had formed *à priori*. We shall content ourselves with indicating the general rules to which, in this special case, the operations of the *greffe* must submit.

In the extraction, in order that the tooth and alveolus should be as little changed as possible, much gentleness must be exercised. The forceps, with well-adapted nibs, should be used instead of the turnkey.

During the operation, when that is practiced, in order not to injure the periosteum, it will be well to envelop the root in a damp linen cloth, and to prop the tooth, if necessary, by a point of the crown. As to the resection, it must be done with the aid of strong Liston shears, and in such a way as to remove, as much as possible, the affected parts of the root. Then, with a soft file, one can round the mutilated summit. The tooth once ready, the alveolus is carefully wiped with pads of wadding which have been soaked in an astringent liquid—an alcoholic solution, for instance. When the blood no longer runs, the restitution is performed, putting the organ in the position which it is to occupy definitively.

Very often, when the replacing has been accomplished, the tooth retains its normal position; sometimes, however, it has a tendency to leave the alveolus, and then one is obliged to use some means to keep it in. In this case, many authors advise one (when it concerns molars) to place a piece of cork between the re-implanted tooth and the corresponding tooth of the other jaw. To us it seems as if simple forced *occlusion* of the mouth would be preferable. The retention is more difficult for the upper teeth. Here one must be inspired by circumstances, and be able to profit by whatever comes to hand. Our predecessors made much use of threads. In two cases Mr. Magitot managed with a groove of paper, fastened with collodion to the anterior and posterior surfaces of the tooth operated upon, and of its two neighbors. To do things methodically, one ought in the beginning to have made a retaining apparatus, perfectly adapted to the tooth which one intends to extract and replace immediately. One would thus have, after the replacing, a ready means of restraining the organ in the same place as before its extraction.

§IV. *Results of the Operation.*

In ordinary and simple cases, the gum which is near the alveolus where the organic phenomena of the *greffe* are produced, becomes red and a little *tumefied* for the first few days.

To oppose this *circumscribed* inflammation, nearly all the authors have advised the application of astringent applications, to which they ascribe a great part of the success. Mr. Magitot recommends poultices (cataplasms) made of a little piece of wadding dipped in a concentrated solution of chlorate of potass.: chlorate of potass., 5 grs.; water, 150 grs. Dissolve by heat.

The first two days there is considerable pain, but this goes off quickly. From the second day the gum is united to the tooth. It is only from

the fourth or fifth day that the root begins to adhere manifestly to the alveolus. Of course, many precautions must be then used to keep the re-implanted tooth immovable. The consolidation is about completed on the tenth day. Under influence of the inflammatory reaction, which is almost always produced after an operation of separated parts re-united, the *fistulæ* furnish an efflux that one must assist. This period past, they close rapidly, when not maintained by bony *lesions.*

§V. *Complications.*

The results of the operation are not always so simple as the one just mentioned. They may be troubled by complications which we cannot pass over.

In the first place, there may be the inflammation of the alveolo dental periosteum, unimportant when terminating in *resolution,* but much to be dreaded when it reaches suppuration, and there is no *fistula* to let the matter flow out of the alveolus. Perhaps Fauchard had this fear in view when he advised not to fill the teeth until they were perfectly consolidated. For, in a case of penetrating caries, the dental *canal* serves, as it were, the purpose of a *fistulous* passage by which the intra-alveolary matter may run out. As we have seen above, *elimination* is produced by an intra-alveolary suppuration having no other issue than the opening of the alveolus.

However, even in this case the *greffe* may succeed; for, as *periostitis* never comes the first day, the opening of the alveolus is closed by the adherences which the periosteum has formed on that side. The matter then makes a passage for itself through the *alveolary partition,* and comes out in that way.

Another complication, less dangerous to the success of the *greffe* than the last, since it concerns only the termination of the fistula, is the existence of a bony burrow. In this case, after the removal of the dental *sequestrations,* one must assist the *reparation* of the bony *lesions.* In the burrow there exist numerous splinters, which should be eliminated; but while awaiting their separation, the fistula must be kept open for a long time. One ought to take care of these bony *lesions,* and support the exterior *orifice* of the fistula, to push in strong injections, or by means of instruments take away the adhering splinters.

§VI. *Observations on the Greffe by Restitution.*

We deem it unnecessary to note here the observations of re-implantation made after complete luxation or extraction for cause of decay. In these cases, reported, besides, by so many authors, the sound roots are in such a favorable condition to success, that no one could doubt the result.

THE MUSIC-BOX.

By F. E. Howard, M.D.S., Genesco, N. Y.

I have been prompted to say something on this subject in connection with dentistry, for I am inclined to think it is novel.

For five years or more I have had a musical instrument of this character in my dental rooms. For several reasons I was induced to experiment with it, in connection with administering nitrous oxide, as well as other anæsthetics.

It is my conviction that the last impression left on the mind of the patient while passing under the influence of an anæsthetic is the first that is taken up by thought on returning to consciousness, and with this idea, I employed the instrument for the purpose of diverting the patient's mind from the operation.

The instrument being in readiness, and controlled at will of the operator by a lever, it is started at just the right time (which is at a stage easily determined by one who has had experience with this agent). The attention of the mind is at once arrested by the music, and usually the patient is wafted into a pleasant strain of thought; cheerful conversation will assist in accomplishing the object; the subject often lapses into insensibility while experiencing a delightful dream, and the whole operation is reflected upon with pleasure.

The subject is in that condition that he does not realize what it is, exactly, or what the effort is for; but it has the desired influence on the patient, and he drifts off, as the music progresses, into some fairy-land, there to dwell, with all that is beautiful and delightful, while the horrible operation of tooth-extracting is going on in his absence. He shortly returns and relates his pleasant experience, and realizes, to his utter astonishment, that his teeth have been extracted.

If this was an instrument that could not be kept out of sight, I am inclined to think the effect would not be so satisfactory—at any rate, with those who are likely to take the gas the second time. For often it is the case that they are not aware that they really heard music. They think it imaginary on their part; for, before commencing to operate, I stop the music, and this leaves them in the dark in regard to the facts, and they are so pleased with the effect of the whole thing, that it delights them in the extreme. I never tell them how the effect is produced, but leave them entirely ignorant of the facts, and allow them to think it was

only imagination on their part, for I may choose to employ this deception at a future day on the same patient. Under these circumstances, I take it, you will sanction the hoodwinking.

Many people are so cautious and nervous, that it is almost impossible to remove the impression that they are to be hurt, or that there are unpleasant after-effects, notwithstanding when told to the contrary by people who have had experience in this direction; and they sit down with the firm conviction that they are to be hurt, and this impression sticks to them during the whole exhibition of the anæsthetic.

Before I practiced this deception, I often had patients sink into these gloomy moods and unpleasant misgivings, and experience all the horror of nightmare, declaring, when consciousness was restored, that they had been dreadfully hurt, when the fact was they were totally unconscious during the whole operation. But this erroneous impression was so fixed upon their minds that they were to be hurt, that all the world could not convince them to the contrary.

This will suffice as a hint to those who administer anæsthetics to ladies without the third party being present. One can easily imagine what the consequence of certain misgivings of the patient might result in. The reputation of a *dentist in this position is suspended by a hair.* It would be hard to demonstrate to the public mind the absolute certainty of our purity.

It is not always the case that every one has a dream of some kind (good or bad). On the contrary, with some persons the whole time consumed is an entire blank, they not remembering anything from the commencement of the anæsthetic effect to the time that they are restored to consciousness.

As before stated, the instrument is in readiness, and started at just the right time; a trap is sprung on the patient that often entirely throws him off his guard; the subject of his thought is changed in an instant, and not unfrequently, when much excited or nervous, he becomes immediately calm, and remains perfectly still during the whole operation. On recovering from the anæsthetic effect, I have seen many amusing and funny exhibitions. One, in particular—that of a young man who was doubtless fond of tripping the light fantastic toe—who remarked to the person whom he supposed to be playing the instrument: "Damn it! why don't you keep right on fiddling? I can dance as long as you can play." And at the same time he was rattling away with his feet on the footstool in a very amusing manner; and all at once, realizing his situation, he laughed out, and remarked that he thought he was

at a dance. Many and many is the time that they describe some pleasant scene of their experience during the operation, when, if I had not taken this method to divert their mind, I am convinced it would have been anything but pleasant.

"GOLD A TEMPORARY STOPPING," WHEN OPERATIONS HAVE BEEN IMPROPERLY PERFORMED.

By Marshall H. Webb.

In his article published in the Dental Miscellany for November, 1877, Dr. C. M. Wright, of Basel, Switzerland, states that "of course gold is a temporary stopping, if made such; but that does not prove that it is not a temporary stopping in the cases Dr. Smith referred to, nor in the soft, white, half-mineralized and young teeth that my article referred to." These are terms frequently applied to those organs which many practitioners fail to operate upon in so perfect a manner as to preserve them. Imperfections in operations are not acknowledged and considered as they ought to be.

While it were well to "improve the *quality of the teeth of patients* by diet, and other means known to the profession," yet, until "other means" are really "*known*" for the improvement of "the *quality of the teeth of patients*. . . a definite principle of applying gold," for the preservation of the organs as we find them, should be that which more thoroughly and effectually "stirs the minds of the lights of our profession in 1877."

Dr. Wright refers to my article which appeared in The Miscellany for September last, and mis-quotes the following: "The mere insertion of a material does not constitute an operation for the preservation of tooth substance." I did not write "tooth *substance*," because enamel, dentine and cementum are tissues, and are constructed by cells; therefore, when referring to the preservation of an organ made up of these tissues, I said "tooth *structure*"—not a mere "substance," or non-living matter.

The doctor also states that I place myself "in the position" and imitate "so perfectly the brother in the article of July, 'who tells me of his grand operations and of their permanence, and in a fatherly way advises me to emulate him,' that I almost expected to see a patient from Lancaster in a few minutes," etc. I did not place myself "in the position" and imitate the brother referred to, because I did not write of my "grand

operations," nor advise Dr. Wright to "emulate" me. By stating how operations ought to be performed, it does not follow that one refers to his own as "grand"; and then, too, before I would advise Dr. Wright to "emulate" any one, I should consider it necessary to see a number of his operations, just as I would have him judge of me, by having the operations that I have performed, not only in Lancaster, but in Philadelphia also, subjected to a critical examination. He would not find that "the crown cavities and the fillings in accessible places had been treated in a masterly manner," but discover that all "places" were *made* accessible, and all operations performed in quite the same way throughout the whole range of cases, and that, too, with gold alone.

Dr. Wright states that I devote "some sentences to questionings"; viz.: "Does Dr. Wright know what a first-class operator is? Has he cultivated his judgment to that point where personality shall have no influence, and only the operations, and a certain number of operators * (said number not specified) shall enter into the consideration? Has he, by former study, and in agony of soul and in spiritual wrestlings, deeply enough impressed his mind with a regard for *truth*, and the necessity that exists to *delve* for it, before he ventures to compliment gentlemen in Europe or Cincinnati as *first-class operators?*" The "sentences devoted to questionings" were really as follows: "Dr. Wright refers to his predecessors, and states, 'Here is a bicuspid, for instance, upon which Nos. 1, 2, and 3 have operated, and which No. 4 has extracted.' He further states that 'these were not common operators, but first-class, conscientious and capable dentists.' It is important to know upon what particular points Dr. Wright bases his judgment in reference to his predecessors being what would now be considered first-class operators, and if No. 4 was such an operator, why he extracted the bicuspid which the other three operators had filled." Dr. Wright should make complimentary references to his predecessors and others "just to the extent that they severally deserve; but when after truth in its relation to principles of practice, it is necessary to delve for, and endeavor to ascertain the causes of failure, and to base and express our judgment entirely upon the character of the operations." It will not only be seen that Dr. Wright has thus very incorrectly stated the "sentences devoted to questionings," but that he has also failed to answer the questions referred to.

"Years ago I (Dr. Wright) was struck with a genius for plugging teeth, and gave my 'experience' in the *Dental Register.*" Had the doctor *acquired* the genius for *performing operations* upon instead of

* I did not, in such connection, refer to "operators"—I stated "*operations.*"

"*plugging* teeth" . . . . "years ago," he would not now regard gold as "a temporary stopping," and attribute the cause of failure in dental operations to "soft, white, half-mineralized and young teeth," and to other "causes of failure," which he mentions as leading him (as would be the case with all others if they would permit themselves to be thus influenced) to "produce bad work;" "among which causes are laziness, inability to control his patient, hurry, incompatibilty of the electric currents, sympathy, etc., etc."

Dr. Wright misapprehends my statements in reference to "definite principles" (I did not say *my* "definite principles"), etc., almost to the same extent that he did "some sentences devoted to questionings." In The Miscellany for September, I stated that 'a great number of approximal fillings must be done over many times' unless each cavity is so shaped—so *made*—that the operator can get at it in such a manner as to enable him to pack gold according to an exact principle."

Dr. Wright further states that if I, "knowing these qualities of gold" (the qualities of cohesion and non-cohesion, and the different methods of preparation and manipulation), "*prefer* the 'retaining point and cohesive method' in all cases, I kiss my hand good-naturedly to him across the seas." In reply to this I will simply state that in performing all operations I *do* "*prefer*" to make a starting-point and to use pure, and therefore cohesive, gold—gold that has had nothing deposited upon its surface to serve as a skin and to prevent cohesion. I prefer to prepare and impact small pieces of cohesive gold not "after a method," but according to exact or definite principles—I know nothing about a "cohesive method." I certainly endeavor to "woo the golden queen after" a principle, and that, too, by a "light touch" of the index finger of the right hand upon the slide that closes the circuit and induces electricity to empower the magnets to bring down the armature of a *properly adjusted* electro-magnetic mallet with regularity, rapidity, and force, upon the instrument for impacting gold. Just here I would state that the electro-magnetic mallet should be guided very nearly the same as a pen or pencil. The instrument should be made to operate upon gold in a manner somewhat similar to that of making dots on paper with a pen. The operation of one requires but very little more labor than the use of the other.

In the article to which Dr. Wright refers, I did not mention the term "method," in connection with the reference I made to my operations, neither did I "*condemn* others' methods," although I gave reasons why "large masses" of gold could not be impacted without there being some

liability of the movement of such gold, and, therefore, a greater number of failures would be the result than where more time and care was taken, and small pieces of carefully prepared gold foil properly impacted. I stated that while "I operated (previous to about four years ago) in a manner somewhat similar to the methods" described by the gentleman to whom I referred, "I was obliged to re-perform many operations upon proximate surfaces; but since then I operate according to definite principles." I would here state that a principle is not originated by mankind; it is a part of law, "an elementary proposition," a fact, and facts are manifestations of truth, and truth the substratum. I also stated, in the article referred to, that "I now meet with but few failures, and those I do occasionally have are due almost entirely to some imperfection in the operation which had occurred and been unnoticed at the time the operation was performed"; therefore it was (not "the faults of the 'exact principles'"), that I stated that "I never performed an operation that I did not see some point or points where I could do better had I to perform the same again,"—not "bad work," but *imperfect* operations, as all the works of mankind are. "No one can ever reach perfection;" but excellence ought to be the operator's object when performing each and every operation. The whole soul should be in the work we do. Enthusiasm is the key-note to art. But Dr. Wright makes the following announcement, viz.: "I (Dr. Wright) succeed in making lots of *perfect* gold fillings; and I perform many operations where I see no points that I think could be made better, even if I had to do them over half a dozen times." W. W. Story, the poet-sculptor, has said (and I coincide with him in every word here quoted), that "No perfect work has ever been made or will be made. I do not believe in the story of Pygmalion, who fell in love with a statue he had carved, for no true artist ever did this. In the field beyond the work that artists do lie the flowers of praise."

BROOKLYN DENTAL SOCIETY.

The regular monthly meeting of this Society was held at the office of Dr. W. T. Shannon, No. 94 Greene Avenue, Monday evening, Dec. 10th, 1877. President O. E. Hill in the chair.

INCIDENTS OF OFFICE PRACTICE.

Dr. I. C. Munroe: I have a case of alveolar abscess, with fistulous

opening through the cheek, nearly opposite the left inferior second molar tooth. The patient is present.

As you see the case now, you can scarcely conceive the condition it was in when I first saw it.

The patient, Wm. McCann, born in Waterbury, Conn., aged 22 years, called at my office Nov. 13th. Fistula was dark purple, about three-quarters of an inch in diameter, somewhat contracted. Left inferior first molar badly decayed, with anterior buccal cusp broken off in extracting second molar on same side some time previous.

The patient said: "I had toothache in May, 1876; went to a dentist in Bridgeport, Conn., who extracted a back tooth (left inferior second molar). The dentist hurt me severely, and I think injured the tooth in front of the one extracted. I had no more pain from that time until last August, when my face began to swell and pain me. I endured the pain three weeks before having anything done; then I went to a doctor in New York, who lanced my cheek on the outside, and considerable matter and blood discharged. He then ordered a flax-seed poultice, which I kept on a week, when the opening in my cheek closed, and I had no more trouble until Nov. 9th, 1877."

Treatment.—Extracted the six-year molar, then passed a probe through fistula into socket of extracted tooth. I then syringed thoroughly with tepid water, and injected aromatic sulphuric acid through into the mouth.

The next day I could neither pass the probe nor inject through into the mouth. I dressed the fistula with iodine, kept it open with tent of cotton, continued this dressing from day to day until last Wednesday, Dec. 5th, when I removed a tubular mass of dead tissue from fistula, and it presents the appearance you now see.

Dr. Wm. Fishbough: I had an interesting case recently in my care. A German woman, about forty years of age, of robust constitution, sanguine bilious temperament, accustomed to taking plenty of exercise, came to me some time in September with a large swelling on the upper jaw, a tumor of a grizzly nature, yielding slightly to pressure, and not giving pain when pressed upon. She told me she had experienced a great deal of trouble with it for about fifteen months. She had been to a physician in the place who has a reputation as a surgeon, and he lanced it twice, and told her to poultice it on the outside of the face to draw it to a head, and cause it to discharge. I examined it, and found a root of the first upper molar (that was on the right side of the jaw) remaining in, and I diagnosed concealed abscess. Extracted the root,

which was followed by copious discharge of pus of a fetid nature. The antrum was excessively implicated, the floor of the antrum was gone, and, in fact, the jaw was very badly caried. I syringed it with salt and water, and cleansed it as perfectly as I possibly could, injected it with phenol sodique, and afterwards with sulphuric acid.

Dr. Hill: What strength?

Dr. Fishbough: Full strength aromatic sulphuric acid.

Dr. Cook: And the phenol sodique?

Dr. Fishbough: About one-third water. I caused her to return every day for some time, then every two and three days, and then every week. I found the aromatic sulphuric acid decomposed the sodique, and that the acid is strongly affected by the soda in the phenol sodique, and I discontinued the use of both, and syringed with weak carbolic acid instead. I continued the treatment with carbolic acid for some time. The tumor or abscess, which is not of a malignant character, very slowly diminished in size, the discharges diminished, their character improved, and I discharged the patient cured (as far as I could cure her, at least) about four weeks ago. She stops occasionally at my door; she says there is a very little discharge of pus yet. The tumor has decreased; but there remains a large opening.

Dr. Chapman: Did you inject the antrum with aromatic sulphuric acid?

Dr. Fishbough: Not the antrum. I was careful not to throw the acid in too far. I did in one instance. I passed it up pretty thoroughly into the antrum and it gave a great deal of pain. She sent for me the next day, but that, I believe, did her good eventually.

Dr. Shannon: Was there any inflammation of the antrum?

Dr. Fishbough: I could not ascertain from any symptoms she exhibited.

Dr. Shannon: It was the alveolar process?

Dr. Fishbough: And the maxillary bone, and a large opening in the floor of the antrum. Sometimes pus would discharge itself through the nose.

Dr. Shannon: Was there much sloughing of the gum?

Dr. Fishbough: Not at all. The alveolar process seemingly not entirely eaten away. It is above the process.

Dr. Shannon: The margin of the union between the true bone and the maxillary bone?

Dr. Fishbough: Yes, sir.

Dr. Cook: Did you inject the antrum at all, to have the fluid pass through the nose and into the throat?

Dr. Fishbough: I found it difficult to do that, but I succeeded in one or two instances. Once with phenol sodique, and in one instance with carbolic acid, and caused a few drops to pass into the nose.

Dr. Cook: I inferred from Dr. Shannon's questions that the opening in the antrum was external to the alveolar process, and not through the socket of the roof. Was it external to the alveolar process?

Dr. Fishbough: It was on the line of union between the two; the opening was upon the line of union.

Dr. Chapman: Which root?

Dr. Fishbough: It was the anterior root of the first upper molar.

Dr. Mills: I had a patient come to me recently with a tooth I had filled nine years ago next spring with white cement; have repaired it a little since I returned to Brooklyn. It broke off about two months ago. The head of the pulp had sloughed away and I found the remainder of the pulp was alive. I advised the insertion of a pivot tooth and made an application for the day. I thought I would try to carry out the idea of Dr. Atkinson, expressed a number of years ago, of removing sufficient of the pulp to allow room for the pivot, preserving the remaining portion of the pulp alive. The question was, how I would remove part of the pulp to get room for my pivot. When my patient came the thought occurred to me that I would take the small wheel burr and see if I could not remove it. I did so. My student ran the engine as fast as possible. I approached the pulp cautiously; carried the burr up, perhaps, one-fourth of an inch, and by some entanglement it caught and removed three-fifths of the pulp. It created a little pain. I dressed with creosote and got my root ready, and I think it was the next day when I set my pivot tooth. I set the pivot temporarily, that I might remove it, which I did after two weeks, and found the pulp alive and healthy. I saw the tooth Saturday, and everything is all lovely still.

Dr. Biddle: I wish to raise my voice against the use of oxychloride of zinc in a tooth where there is a slight stratum of bone over the pulp or when the pulp is exposed. About six months ago, or less, a young lady patient went abroad, for whom I had treated a tooth, filling the same with gutta-percha. She went abroad and had a little trouble, probably due to the impactment of food between the teeth. She went to a dentist in London, who took out my filling and put in oxychloride of zinc. She came in the other day with a dead tooth.

Dr. Brockaway: It seems to me Fletcher's dentine, and other preparations, that are entirely kind to the pulp, may be employed with perfect safety in all such cases. While I am up I will speak of a case that

came in this afternoon. Nothing very surprising, but showing a certain degree of abnormality. A little girl between nine and ten years of age. The six-year molars and three of the second bicuspids in place, and two of the lower incisors fully developed, but almost no sign of the upper incisors. The temporary teeth remained in good form and showed very little evidence of absorption. The child was brought to me to know if it was best to remove those incisors or wait a little longer. I would like to have the judgment of some of the older boys on the subject.

Dr. Shannon: First or second bicuspid?

Dr. Brockaway: The second was in.

Dr. Shannon: Fully developed?

Dr. Brockaway: Yes, sir.

Dr. Shannon: Did you ever know of the failure to erupt the centrals?

Dr. Brockaway: No, sir.

Dr. Shannon: I should take them out.

Dr. Brockaway: I shall.

Dr. Mills: I would ask Dr. Biddle if the tooth reported by him had ached previously while in his care?

Dr. Biddle: No, sir; I cared for it three years.

Dr. Mills: Did it ache in London?

Dr. Biddle: It did; but I attributed that to the fact of the tooth being recently filled. The food pressed up and irritated the periosteum. The pain ceased upon removal of food.

Dr. Mills: It is my opinion that the pulp had become inflamed to that extent, that the oxychloride of zinc was not responsible.

Dr. Biddle: There was some life in the tooth when she returned, and I extracted the pulp

Dr. Mills: That proves my point. I don't think it is one of the worst things that could happen that a portion of the pulp did die. Had the patient come to me at the time with the tooth aching, I should have thought that the pulp was disturbed and needed relief, and I would have removed the thin stratum of bone and endeavored to save a portion of the pulp.

Papers were read by Drs. G. A. Mills and A. H. Brockway, which we are obliged to omit for lack of space.

Dr. Biddle: I think we cannot overestimate the importance of preserving a minute record of all our operations, making possible valuable statistics of our work and reliable data from our experience, to which we may refer at all times.

I regard sharp burrs as valuable aids in daily practice, also the exercise

of patience, especially when operating for our little patients. It pays to be very tender and thoughtful of the children.

Dr. Fishbough: There has been nothing said yet that bears directly upon mechanical dentistry or any aids that especially relate to that. I will mention a little discovery that I have made—it may be of use to some. Most, if not all of us, have abandoned rubber and abandoned Bacon at the same time. I don't like pork very well myself, and have gone to the celluloid. We sometimes feel the necessity of an easy way of correcting a fit. In some instances celluloid has sprung and shrunken, and in other instances, of course, as we all know, the gums will shrink a little, and the fit will be imperfect after awhile, and it is very convenient for us to know how to remedy all cases of that kind. The plan I have adopted, and which I have found effective, if the fit is not too bad, is this: If the plate is thin, and subject to the slightest tendency to spring when pressed against the roof of the mouth, I fill all the palatine portion of it with wax, and let it get hard, thus stiffening the plate. I then use this plate as an impression cup; and, with a small amount of plaster, take an impression of the mouth, varnish and oil this impression, and make a new cast of plaster; remove all the plaster from the plate, then place it upon the new cast, and imbed it in plaster in a flask in the usual way. I then take up the ordinary red rubber—a quantity sufficient to fill the spaces between the plate and cast—then close the mould, heat it up and press it together. Of course the rubber will sink in those places where it has the most vent—it will seek room. But you will find afterward that your plate is complete, and if the celluloid is not too thin, you will find you have corrected the fit perfectly, even where there is shrinkage of the gums.

Dr. Mills: In the matter of an assistant, I endorse Dr. Brockaway heartily, one would be indispensable with me. I have employed an assistant for nearly fifteen years, and I consider the value of an assistant as beyond computation, and the only wonder is that more men do not see the value of them. Even on the score of physical economy, I think it is an advantage. I think, taking the majority of the members of our profession, the men are frail, and the draught on the nervous force is rapid and strong. Every man who uses an engine knows it is impossible to run it himself and not divide the nervous force. There is one thing I want to speak of, and many may think it strange, for I have been a strong supporter of the unlimited use of the rubber dam. I hold it to be one of the most valuable adjuncts we have in practice. Within the three last years I have changed my practice largely in the use of the

rubber dam. I don't advise that, because I do, and can do certain things, it would be a wise thing for a young man of less experience to do as I do; I believe young men especially should facilitate themselves in the use of the dam. In the added experience of years we come to be able to do many things we could not do before. Instead of using the rubber dam as generally as I used to, a major number of the operations are performed without it; and I would suggest an idea which came from a paper read by Dr. Adams, of Worcester, Mass., under the title of "Prevention of Cruelty to Patients," and yet I don't mean it would apply to such an operator as Dr. Brockaway. I know he does it nicely, and I know of other men who do it nicely. I think the patient has a great deal of discomfort which is not necessary. I have come to make the simple class of operations without it, and I am surprised at my own expertness in the last three years in facilitating myself to operate so easily without rubber in a large proportion of cases. In difficult cases I fall back upon the rubber invariably, and would not be without it. I save a great amount of time and inconvenience to myself and the patient.

Dr. Fry: I have what I consider a very nice little improvement. You have no doubt seen some of my rubber plates, the inner surface covered with gold—a very thin coating of gold. I have found them clean and neat. More recently I have been using corrugated gold, No. 4, and the result is very beautiful, very perfect, very permanent, and very pleasing to the patient. I cover the plaster cast with shellac varnish, and take a full leaf of gold, or two pieces of the proper shape, and very carefully place it on the cast. You will be astonished at the beauty of it, when you see it done.

Dr. Mills: Just one thickness?

Dr. Fry: Yes, sir; be very careful and take a little extra time. It will pay you to do that little job very nicely.

Dr. Hill: Do you suppose that it assists in getting rid of the excessive heat of the rubber plates?

Dr. Fry: A lady came to me some time ago, mouth badly inflamed, the roof of mouth covered with pus. She had worn an upper plate of the ordinary red rubber for a long time. I treated the mouth with weak solution of sulphide of zinc. After subduing the inflammation, I made her a new plate, lined with the corrugated gold, as described. I examined the mouth a few days since; it is in real nice condition, and very much improved. I have an idea that those mouths that are in that condition that rubber is accused of producing, is caused by heat, by reason of the non-conducting property of the rubber.

Dr. Shannon: I have no doubt Dr. Fry is honest in what he says; but I must take issue with him. I unhesitatingly aver that he is in error when he says that this sheet of gold, of No. 4 thickness, serves as a conductor for the heat evolved from the roof of the mouth. I deny it most emphatically. It is physically impossible for a thin plate of gold so to do. The rubber is a non-conductor, in the first place. That plate will press against the soft tissues of the mouth, and prevent the escape of the heat contained there. Cover that plate with a thin or heavy gold plate, if there is no mode of escape, it will remain there after a few minutes. If there is a mode of escape, then it will be a success; but if the gold plate is confined, I deny that there is any conduction of heat from the mouth.

Dr. Fry: My practice bears me out. I am perfectly satisfied with it. I hope the gentlemen will use it in cases where they can demonstrate it to their own satisfaction.

Dr. Shannon: I must insist that our reporter shall not stultify the Society, and declare before the world the judgment that a thin plate of gold between the soft tissue of the mouth and a non-conducting rubber plate will carry off the heat.

Dr. Fishbough: I think Dr. Shannon is perfectly philosophical, so far as the conduction of heat is concerned. We may cover ourselves with a tin coat, and get between blankets, and in a few minutes we will be as warm as if we had not the tin coat over us. The gold, however thin, will conduct electricity.

Dr. Shannon: That is not it. It is the heat that causes the trouble in the rubber plate. The electricity matter is another point of the discussion.

Dr. Brockaway: I want to say a word on this subject; I acted upon the hint that Dr. Fry gave us at Dobb's Ferry last week. I put up a rubber plate in that manner. Of course the test of time cannot be taken into the account; but I can verify the beautiful appearance of the work, and the entire satisfaction it gives to the patient. I never put in a plate which gave more thorough satisfaction than this one seemed to do. I have no doubt that the coating of gold will be of advantage to rubber plates, whether it reduces the heating property of the rubber, or what effect it does produce. It certainly is beneficial.

Dr. Mirick: What is your method of applying it? Could you make the gold perfect over entire surface?

Dr. Brockaway: Yes, sir; I didn't coat the model with shellac, as Dr. Fry does.

Dr. Fry: How do you put it on?

Dr. Brockaway: With a piece of bibulous paper gently press it over the surface.

Dr. Fishbough: In coating the cast with shellac, don't you find the gold adheres to the shellac?

Dr. Fry: It comes off very beautiful.

Dr. Mirick: I can testify to the beauty of Dr. Fry's work. The inside was perfectly covered with gold. It was not broken over the rough places, and that was one reason why I asked Dr. Brockaway about his method.

Dr. Shannon: I don't wish any gentleman to understand me as deprecating or denying the position he assumes in regard to the beauty and finish of this mode. I am very much obliged to Dr. Fry, and I shall adopt the plan. It was simply to correct what might seem to be an erroneous impression made in regard to this conduction of heat.

Dr. Hill: Would there be any objection to the use of gold No. 8 or 12?

Dr. Fry: I tried that. I had two sheets made, and I told the maker to make it as thick as he could, and corrugate it. He told me there was a limit to his ability to corrugate. I used one of the thicker samples, but it didn't turn out in that particular case as good as my No. 4. There is a mechanical difficulty in adapting it to the cast. I have another sheet of this thick, corrugated gold, which I shall use in my own case, and I hope I shall be able to show you a little piece in my own mouth.

Dr. Dolbeare: Dr. Shannon don't like to have the reporter get anything wrong. I don't like it. If I understand him right, he says that the gold plate in the place of Dr. Fry's corrugated gold would be no better.

Dr. Shannon: No, sir.

Dr. Dolbeare: He said if there were holes through the plate, and those holes were filled with gold, the heat would pass through them and that would be a benefit.

Dr. Shannon: Yes, sir.

Dr. Dolbeare: If the heat will pass through those rods, would it not pass from the roof of the mouth around the edges of the gold plate and go off in that way?

Dr. Shannon: No; because the atmospheric pressure prevents this. The plate, if a good fit, is somewhat imbedded into the soft tissues.

Dr Dolbeare: Suppose he allows his corrugated gold to pass over the edge of the plate?

Dr. Shannon: Then it is all right. He didn't say he did.

Dr. Cook: Has Dr. Fry made any claim that it conducted the heat off? I didn't so understand it. He simply stated the fact—the result; he didn't attempt to explain it; I don't so understand. I understand that this Society was not to be held responsible for the different opinions, expressions or method of practice advocated, as endorsing them. That it was simply the individual, and not the Society, that was speaking here.

Dr. Miller: I would like to suggest that it is not yet settled as to what causes the injurious effects of rubber, as to how they are produced. Now I have seen a marked improvement in the mouth where rubber of the natural color has been used. I don't think Dr. Fry's remarks would conflict with the general understanding.

Dr. Mirick: Whether it is the rubber that causes the sore mouths or not, Dr. Miller says he has seen a marked change in using the black rubber. I think in making it over he made a better fit and prevented the chafing and soreness of the mouth. I had a case the other day; a lady who had worn a gold plate, and had a sore mouth. I made a plate on rubber many years ago. She says she has not had a sore mouth since she wore the rubber plate. I think the whole trouble is due to misfits and consequent chafing of the gums.

Dr. Miller: I find by discarding almost entirely the red rubber I have got rid of sore mouths.

Dr. Mills: Dr. Miller has some evidence on his side. Dr. Chase made the statement that he had seen fifty cases of black rubber with invariably good results. He made a plate composed one-half of red and one-half black rubber. The surface underneath the black rubber improved, while that portion covered by the red didn't.

Dr. Shannon: The idea presented by the remarks of both Dr. Miller and Dr. Mills, convey the impression that the mercury in the rubber is the cause of the trouble. Dr. Chase says the red rubber injures. The inference is that it is the mercury. I have had but two or three cases in my practice of twelve or fourteen years, where any degree of inflammation or irritation of the membrane has been caused by red rubber. One was the case of a clergyman who came to me for other purposes. I noticed the mouth was inflamed; was as red as a piece of raw beef, soft and spongy, and beyond the line where the plate extended there was a perfectly normal color. But everywhere the plate touched it was red. He had become accustomed to it and it gave no pain. I called his attention to the objectionable state of the mouth. He said it was always so. I made him black rubber plate. It was a good fit too. It was perfectly satisfactory; there was no trouble, but it made no difference in the mouth.

Dr. Jarvie: I have recently seen three cases where gold plates were worn presenting the condition Dr. Shannon has described. If we are to place any weight whatever on the investigations of scientific men, on investigations conducted in a scientific manner, we must believe that the mercury used in coloring the rubber has no effect upon the mouth. It seems to me there is no use discussing this question over and over again. It is only recently that a committee of gentlemen on the other side reported that the red coloring matter is insoluble, and cannot have any effect upon the soft tissues, and their investigation was thoroughly scientific. A committee of dentists of our own country have made a similar report. It seems hardly worth while for us to discuss the question. One says, "I believe it does," and the other says, "I don't believe it does," and they have no reasons, only they see it when red rubber is used and they don't see it when black rubber is used. I have seen this inflamed condition of the mouth where the person has used a gold plate, and most marked, in three cases, in a very short time. I have seen it in rubber, and I have accounted for it on the non-conducting quality of the material used. I can't believe, if I am to take the results of these gentlemen's investigations, that this coloring material is injurious.

Dr. Miller: Has Dr. Jarvie not seen under the microscope the crude mercury in the plate?

Dr. Jarvie: I have never examined it.

Dr. Mason: I have seen a case of about as sore a mouth as I ever saw, which was caused by wearing a retaining plate of black rubber. This was simply put in to hold the teeth in place.

Dr. Fishbough: With regard to the discovery of crude mercury in a rubber plate, I must confess myself a little more than skeptical. I should be very much inclined to pronounce it impossible, absolutely so. In order that the red oxide of mercury may be changed and decomposed and brought to the condition of crude mercury, there must be a most powerful chemical re-agent in the mouth. I have seen, to be sure, something of rubber plates that may have been mistaken by a casual observer for metallic mercury, but on careful investigation it proved to be something else—it proved to be sulphur. There was a lustre about it that some might take for crude mercury, and I think that has originated the impression that has taken possession of the minds, not only of Dr. Miller, but of others. In this whole question we have omitted to take into consideration the idiosyncrasies of certain patients. There are some who can't bear to have the palatine surface of the mouth covered

with anything, and there are others who can bear everything; and in order to arrive at a just conclusion in regard to the effect of rubber or gold, or anything else, whether black or red, we ought to take into consideration the constitution of the patient.

Dr. Houghton: I have experienced this same condition of the mouth—this red and inflamed condition—from wearing a celluloid plate, and that same condition has been improved and remedied by making a rubber plate.

Adjourned.

MEETING OF THE FIRST DISTRICT SOCIETY.

At the Residence of Dr. Lee, 23 Perry St., New York.

Dr. Wm. H. Allen in the Chair.

INCIDENTS OF OFFICE PRACTICE.

Dr. R. M. Reynolds: This day I have had a case of this so-called Riggs' disease. The case I treated two years ago, and here is a tooth I filled and was obliged to remove. I would like to have the gentlemen examine it. It is entirely free from tartar. I found it in that condition about a month ago when I removed it.

Dr. J. S. Latimer: It takes some courage to get up and confess, and yet that thing I feel called upon to do for the benefit of others. I had a patient come to me recently with two exposed pulps. The cavities were on the proximal sides. I applied arsenious acid (having the rubber on both teeth) in small quantities, laid a little piece of absorbing paper over it, and over the arsenic on each, and filled, not the cavity only, but allowed the plaster of Paris to remain connected between the teeth. I have used plaster of Paris for this purpose for years, and it is a good covering; but I don't know that I ever before left the connecting portion between the two teeth, and I will never do it again. I advise you not to do it. The septum between those two teeth I found dead. The patient was a very timid patient, and cried out at the thought of being hurt. I took a large hatchet excavator and cut that dead portion away, and I expect that the teeth will get tolerably comfortable; but the Lord deliver us from that mistake again.

Dr. Atkinson: Use no more arsenic again.

Dr. Mills: I would like to mention an incident that is interesting to me, from the fact that I have heard a statement made by Dr. Atkinson, about cutting off the roots when the pulps were alive. This case came in my hands a short time ago. A tooth I had filled nine years ago; a tooth that was filled with judgment. I filled it with osteo-plastic or the white filling, and it has remained up to this time. I repaired it only once in that time. I found the pulp exposed, and I was obliged to cover it. It seemed to be congested, but I thought I would take my chances. It was a superior lateral incisor. I repaired the filling, and after nearly three months the lady came to me with the tooth broken off, and I found the pulp was living in the root. She was a young lady, twenty-three years of age. I hardly knew what I would do, but covered it with cotton; and in the mean time I saw Dr. Atkinson and asked him how to get rid of the pulp. He told me, and on Monday I did as he had suggested. I took the steps that came as I went along. I found I was not going to be very successful, and so, while I was thinking, the thought suggested itself that I would use the small wheel burr, in the engine. I gradually carried it to the pulp and let it touch as lightly as possible, and it got in about a quarter of an inch, and by some good luck caught the pulp and twitched it off. The rest of it remained and was bleeding. I went on with the treatment, and put in a pivot tooth with a chamber pivot for the purpose of watching it. I have seen it twice in the last four weeks, and everything is successful.

Dr. Allen: Did you treat the pulp?

Dr. Mills: With creosote simply.

Dr. R. M. Reynolds: Did you allow the pivot to come to the pulp?

Dr. Mills: Not to the pulp—just short of it.

Thoroughness in Dental Operations.

Dr. J. S. Latimer: The subject is an important one, and one that ought to receive our attention. I will say that we had an illustration of thoroughness this afternoon in Dr. Mills' operation, with special reference to that; but the whole time employed in his clinic was on the removal of tartar from four teeth. If any time be spent without thoroughness, the operation must necessarily be a failure; and yet the difficulties in the way of complete success are very great, especially well down near the apices of the roots; and I wish to say that I commend most heartily the thoroughness with which the operation, so far as I could see, was performed; the patient persistence which made him continue to work, work, work on those teeth, until he got them, as he

supposed, just right. For my part, I wish to say that I do not commend the practice of immediately filling teeth that are abscessed, or have exposed pulps, filling them permanently, and sending the patient home with the hope and expectation that there will be no further difficulty. It is rarely the case that we may put in a filling that is not a test filling that may last a month or two months, and shall give the patient's purse the benefit of the doubt. I think it is thoroughness to be cautious and painstaking in that particular. It is not thoroughness to put in an expensive gold filling when we have not given the tooth the test of time. I spoke at our late meeting of the necessity of thoroughness in filling with amalgam in having the patient return for the completion of the smoothing and polishing; and I wish to say here that amalgam filling, if properly finished, will do very much better if thoroughly smoothed and finished.

Dr. Atkinson: We are apt to follow in the lead of men who are evidently honest and earnest, without taking into consideration the other quality of efficiency. I don't care how honest a man is, if he is not intelligent upon the subject upon which he speaks, he is not fit to follow. I don't care how intelligent a man may be, if he is dishonest he is not a safe leader. And it is my deliberate judgment that the advice given in some cases where pulps have been extirpated, but no periostitis present, is worthy to be catalogued among the nesciences. Why do I say that? Simply because if it is disintegrated there never will be so favorable an opportunity to make a complete success of filling that tooth permanently. Then suppose the cry has been that the person was to do damage by going through the end of the root into the territory beyond, when the abscess would be aroused into activity. Is there any possible advantage to be derived by taking out that filling, and going in and treating? Does not every man that understands the physiology and pathology of the teeth know that it is wiser to lift the lip, and go through the alveolar process, and let out the dead matter, and allow the process to be remanded back to Nature's domain, and she will take care of it? Now, as to the destruction of the pulp, don't apply arsenic to the human mouth. If you give arsenic at all, give it in a solution, by which it can be carried away. We have had an example to-night that ought to stand as a warning against going in with any such dangerous agents. Never put it there. If there is only half of the pulp alive, let the half left be resuscitated, and helped to perform its work.

Dr. W. M. Reynolds: Nearly two years ago I got the idea from Dr. Atkinson that the most thorough was the best way to treat such teeth;

and since that time I have been in the habit of going through to the pulp canal in cases where it was possible, to make an opening through the buccal or anterior surface, and cleansing out the part with the syringe, forcing water through, and filling permanently. A number of cases otherwise treated have been less successful than when treated in this way. I have in my mind three cases. There was no apparent difference in the condition of the teeth. In one case I made an incision through, and the other I filled temporarily. The one I filled permanently has given no trouble, although filled a year ago. The other I refilled three months ago.

Dr. J. S. Latimer: I presume the doctor has reference to those cases in which the pulp has died, and the pulpless teeth have been filled with amalgam.

Dr. W. M. Reynolds: The pulp has been removed in the case referred to. The burr has not been passed through the apex of the root.

On motion of Dr. W. M. Reynolds, a vote of thanks was passed by the Society to Dr. Atkinson for his paper.

Dr. Odell: Among my 1,300 families [laughter] for whom I have operated for the last seventy-five or eighty years, I have noticed that most of the fillings put in were gold fillings. A great many of them, a good per cent., two per cent., six per cent., were amalgam. None of them were osteo-plastic, nor Hill's stopping, or gutta-percha, nor any tin foil. On looking over the list of these operations, and looking over the mouths when the patients return to me, I find out of the 1,300 families, I won't say that not five teeth have been lost, but I didn't have any trouble with those fillings worth mentioning. It is only in the very soft teeth, which we all dislike to see at the first sitting, that I am very much troubled. In that case I can roof over with gold quite as well as Dr. Flagg told us he could with Hill's stopping or gutta-percha. He punched a little hole in the side and stuck in a little piece of gutta-percha. I punch a little hole in the side and put in a little more gold, and I don't see but what that stands as well with gold as Hill's stopping. When we speak about thoroughness, I do find that in the various bottles, having all the first-class dentist's operations in them, which you won't find in my office, that many of the troubles that have arisen have been from a want of thoroughness in operation, and not from material. I have found splendid gold fillings put in, in some cases, by the very best men who ever handled a plugger—as good as the best—decayed at the cervical margin; sometimes away below the gum, where they have no business to decay at all. The reason is want of thoroughness. Not the

gold at all. Not electricity at all. Where does the want of thoroughness come in? Not in finishing the upper margin. Suppose it is an upper tooth, with the filling flush with the surface of the neck of the tooth. What is the result of that projection? It admits air and water and food, and don't admit service.

(To be continued.)

ITEMS OF INTEREST.

At a recent meeting of the Odontological Society of Great Britain, Mr. Weiss called attention to the late fatal case of artificial teeth swallowing, as reported in the *Times*, November 6th. At the inquest evidence was given that on Sunday, 28th October, John William Digby, aged 76, then in good health, while eating his dinner, swallowed his artificial teeth. Two months previous, it appears, the plate he was wearing, which was made of platina, broke in two, and the deceased had continued to wear the larger half ever since. When the accident occurred, his wife at once attempted to remove the teeth, but could not. Dr. Walsh was called in, but he also failed; after which Dr. Durham, of "Guy's," was summoned, but he was equally unsuccessful, and eventually the man expired on the Wednesday following. A *post-mortem* examination was made, and the jury found that death had resulted from the shock, and from the injury to the throat.

The reason why the surgeon could not remove the teeth was because one portion of the plate, where it had been broken, formed a hook, which caught in the muscles of the throat.

Dr. Hardwicke had most courteously placed the broken denture at his disposal, and certainly a more dangerous piece of mechanism it was impossible to imagine. It could no longer have fitted the mouth, and the man being at an advanced age, pharyngotomy was not attempted. The statement that death has resulted from the swallowing of artificial teeth is calculated to make a very unfavorable impression upon the public; but that impression is materially altered when we come to investigate these cases. We find in this, as in many other instances, that the patient must be blamed for his own negligence, the work having broken, and being worn in an imperfect state.

Mr. Charles Tomes showed a vulcanite flask which had been sent to him for exhibition by Mr. Palmer, of Cheltenham. It was a modification of Trill's flask, and had been contrived by Mr. Brewster, Mr. Palmer's assistant, the object being to obtain better access to the front of the mouth. It was not intended to supersede the flasks now in use for ordinary work, but would be found very useful in special cases, where the mineral teeth are so close to the gum as to make it difficult to get

the rubber in front of the mouth, as well as at the back or palate, without having the flask in two pieces; the teeth being in one part and the model in the other. Mr. Palmer had found that bad fits resulted from this, through undue pressure, and that much grinding was necessary to get the teeth to bite.

The flask was closed with bolts screwed into the gun-metal and nut, while a piece of steel across the bottom formed the two points against which the nuts acted, instead of being secured by two pins, as in Trill's flask. In the larger half of the flask was a removable plate, so contrived that by unscrewing the nuts and two screw-heads, the top and front of the flask could be removed, and access could thus be obtained to the palate, back of the mineral teeth, and to the labial part and gum at one and the same time, the teeth and model being still rigidly fixed. After packing it was easy to open or close either part for the purpose of adding or of cutting away rubber. It was also very useful for vulcanizing vulcanite teeth on gold uppers.

Mr. Charles Tomes showed an interesting specimen of an odontome attached to a lower molar tooth, which he had found in the Society's Museum.

Mr. Moon said that the account Mr. Tomes had just given of the nature of his radicular odontome was of very considerable interest; for that specimen, though smaller in size, was, in the manner of its attachment to the tooth, remarkably similar to other recorded cases of radicular odontomes, and to the specimen which he had to show. This had been extracted by himself from a patient at Guy's Hospital. As the clinical history was interesting, he would read his notes of the case. "The patient, a married woman, aged 38, stated that eight years previously a swelling the size of an egg appeared over the left ascending ramus of the lower jaw; the tumefaction, which extended also within the mouth towards the fauces, was accompanied by almost complete closure of the jaws, and by excruciating pain. After eight months the swelling subsided, and a bony mass appeared above the left lower tooth; this gradually increased in size in an upward direction until the patient came under my care. At that time its upper part had passed out of view and out of reach, behind the distal surface of the second upper molar and the tuberosity of the superior maxilla, even when the mouth was opened to the widest extent.

"Throughout the eight years the swelling, with its attendant closure of the mouth and severe pain in the temple and left side of the lower jaw, had recurred at intervals of two or three months, lasting for two or three weeks at a time: between these attacks the symptoms subsided entirely. The swelling had sometimes extended downwards over the neck, and

upwards to the zygoma, giving rise to ecchymosis around the eye: the wisdom tooth had gradually been pushed inwards towards the tongue, while the odontome had come more into view, and had polished facets on its anterior aspect, formed by attrition against the distal surface of the second upper molar. The patient, who, through dread of a surgical operation, had all this time avoided consulting a medical man, was at length seen, at the Gravesend Dispensary, by Mr. Nesbitt, who kindly sent her to me. The removal of the odontome was very easily effected by extracting inwards the wisdom tooth to which it was attached."

NEBRASKA'S CLAIMS TO A VOLCANO.

The last earthquake at the West was supposed to have radiated from a locality in Nebraska that has been popularly regarded as the site of a volcano. Professor Samuel Aughey, of the Nebraska State University, has recently made an examination of the ground. The seat of disturbance is on the banks of the Missouri, in Dixon County, about thirty-six miles from Sioux City. A bluff, about 1,100 feet long and 160 feet high, sloping at an angle of 60° to 80° toward the river, is at present the place where the phenomena are most exhibited; but other bluffs at a few miles' distance have been similarly affected. Two years ago, a portion of this bluff, half as large as what is left, broke away and fell partly into the river. On the bluff sounds were heard proceeding from the interior, especially on placing the ear to the ground. Flames sometimes broke forth, occasionally at night. Steam escaped from crevices. On digging into the bluff, intense heat stopped the work after proceeding a few feet. Selenite, alum and magnesic sulphate in crystals were abundant. Professor Aughey regards these features as not volcanic in the usual sense of the term, but simply the result of local chemical action. The formation is cretaceous. The bluff is capped by calcic carbonate. Beneath are shales containing ferric bisulphide in crystals of pyrites. Below the shale is a soft limestone, containing carbonates of magnesia and alumina. The chemical reactions consequent upon part of the soil being soaked with water after its fall towards the river, have been the decomposition of the pyrites, the production of sulphuric acid, and the attack of the acid on the alkaline carbonates. The heat evolved in the first of these reactions is, of course, very great; in the latter part the violence of the performance must be increased by the liberation of carbonic anhydride. All the authenticated disturbances are thus easily explained.

OBITUARY NOTICE.

By Dr. J. G. Ambler.

DR. GILBERT A. FOSTER, OF UTICA, N. Y.

On the 7th of December, 1877, after a long and painful illness, which he bore with Christian fortitude and submission, Dr. G. A. Foster went peacefully to his reward, surrounded by his family and friends, who had done all that loving hearts and hands could do to mitigate the agonies and intense suffering of weeks, with no relief except in the unconsciousness of sleep. Yet his darkest hours were made endurable by the serene brightness of a nature into which gloomy forebodings never entered, thus ending a long and honorable career as a man, citizen and dental artist. In him our profession has lost one of its brightest ornaments; society at large, and the community in which he lived, have lost a social, intelligent and genial member; the church an earnest, zealous advocate for the truth—one whose life fully illustrated the principles he professed. The Masonic fraternity also mourns his departure, but rejoices in the record he has left. It was my great privilege to form his acquaintance some thirty years since, at a time when dentistry was just throwing off the shackles which had hitherto kept it outside the ranks of what are termed honorable professions. Dr. Foster, with many others who have preceded him, entered with an earnest zeal, equaled by very few, the ranks of those who were determined to make a reputation for our profession which would demand recognition from the others, as well as the community at large; associating with such men as *Harris*, *Hayden*, *Maynard*, *Baker*, *Townsend*, *Allen*, and many others, who, like him, saw and felt the necessity of associated effort; and to this end the American Society of Dental Surgeons was formed. But finding the insufficiency of this organization, the American Dental Convention was founded, on a broader and more democratic platform, calculated to embrace the whole profession, and thus facilitate that elevation so desirable, and to which he had fully committed himself. Other organizations followed in rapid succession, having imbibed the same spirit which actuated him. To all of them he gave his hearty approval, and, as far as possible, co-operation with them. In none of those organizations did he aspire to anything but active membership, preferring faithful service in the ranks to the honors of office, although often urged to accept. The district in which he resided, however, forced him to assume the office of President at its first organization. His friends and neighbors, also, on one occa-

sion, succeeded in inducing him to represent them in the city councils; but his favorite position was in the ranks—never seeking notoriety. But he delighted in kindliness, and in what is sweet and bright in life. He was happiest in his own home, where he was the chief source of happiness to all. He asked no higher pleasure than that which he derived from friendly intercourse with his family and friends. His professional brethren ever found in him a social and genial companion, rejoicing greatly in everything tending to the advancement and elevation of his chosen profession—free from professional as from personal jealousy.

Dr. Foster was born at Litchfield, Herkimer County, June 3d, 1803. He came to Utica and commenced the practice of dentistry (to which he had previously devoted himself), taking rank with the first and best. Being a man of natural taste and refinement, he soon secured to himself the confidence of the community and the respect of his associates, which he retained to the day of his lamented death.

He leaves, besides his widow, three children: Dr. Charles B. Foster, who has been for years associated with him in practice; Mrs. F. C. Ingalls, of Chicago, and Miss Kittie E. Foster, of Utica. He was a life-long professor of religion, and, at the time of his death, was a member of the Reformed Church. He was for twenty-five years an active Mason, and was buried with the highest Masonic honors.

The grave has closed over the mortal remains of our departed brother, but his "struggling soul is free, and the world which it fleeth is a world of iniquity."

Foster! dear, familiar name,
  Loved wherever it was heard,
Breathe sorrowfully, Fame,
  As no more a living word.

Foster! gentle, wise and good,
  Husband, father, all is o'er.
Home and hall and fav'rite wood—
  They will hear his voice no more.

Gone, the philanthropic heart;
  Gone, the comprehensive skill;
Paragon of love and art—
  Gone! and who the void can fill?

Thus we mourn the loved and lost,
  While a Christian gains the skies.
Let us also count the cost,
  And, like him, be good and wise.

ERRATA.—In report of Brooklyn Dental Society, on page 22, 8th line, for "anterior," read posterior; on page 24, 6th line, for "roof," read root; on page 26, 9th line, for "fit," read misfit.

NOTICE TO SUBSCRIBERS.

The Post Office Department having ruled that the colored subscription leaf that we have been accustomed to publish with the MISCELLANY each year, cannot be inserted without subjecting the whole issue to more than double postage, we are compelled to omit it, and to request subscribers to forward their subscriptions for the ensuing year without waiting for the customary blank. Please state your full name, Town, County, and State plainly. Our Gutta Percha Stopping is still offered as a premium, and is yet without a rival in quality and popularity.

We shall spare no effort to maintain and improve the DENTAL MISCELLANY during 1878. No one actively employed in Dentistry can read its practical articles, or even those of Dr. N. W. Kingsley alone, without gaining more than the cost of the magazine.

The necessity of removing the colored leaf, re-wrapping and re-addressing our whole November edition has caused us great delay. We shall endeavor hereafter to publish not later than the 15th of each month.

We invite your continued aid by subscriptions and by literary contributions.

EXPLANATION.—At the end of the first year of publication, we struck from the list of subscribers for the following year the name of every person who did not send us a formal renewal of his subscription. Very soon complaints came from those who thought we distrusted them, and who said at once, put us down for a permanent subscription. On adopting the other plan of sending to all who had once subscribed, we caused some complaint.

In the hope of suiting the larger number, we decide to send to all who have paid all previous subscriptions, unless they write to the contrary. The premium is sent *after* receipt of payment of subscription. See last page of cover concerning premiums.

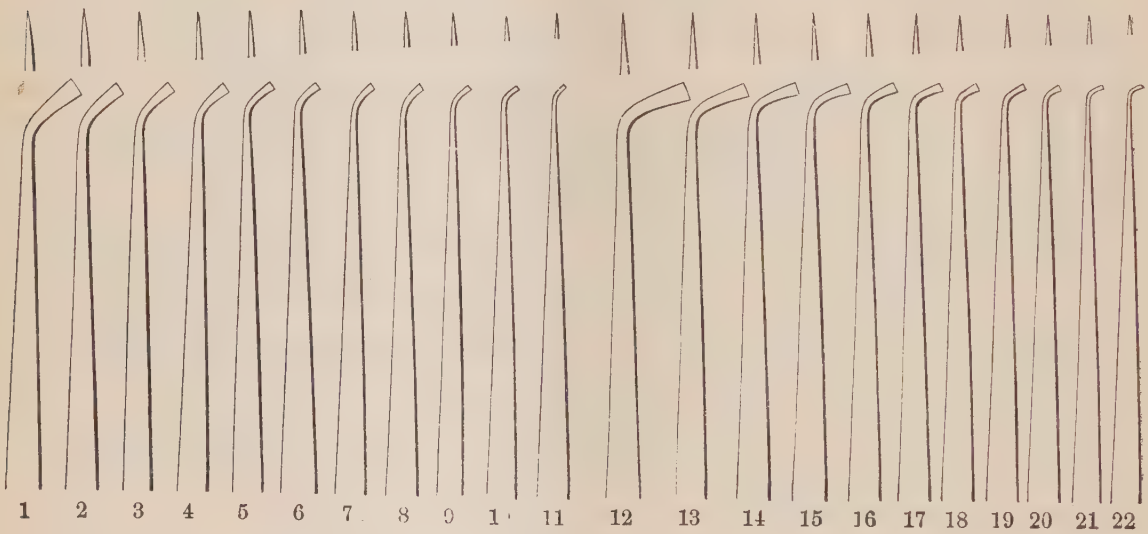
JOHNSTON BROTHERS, 1260 Broadway, New York.

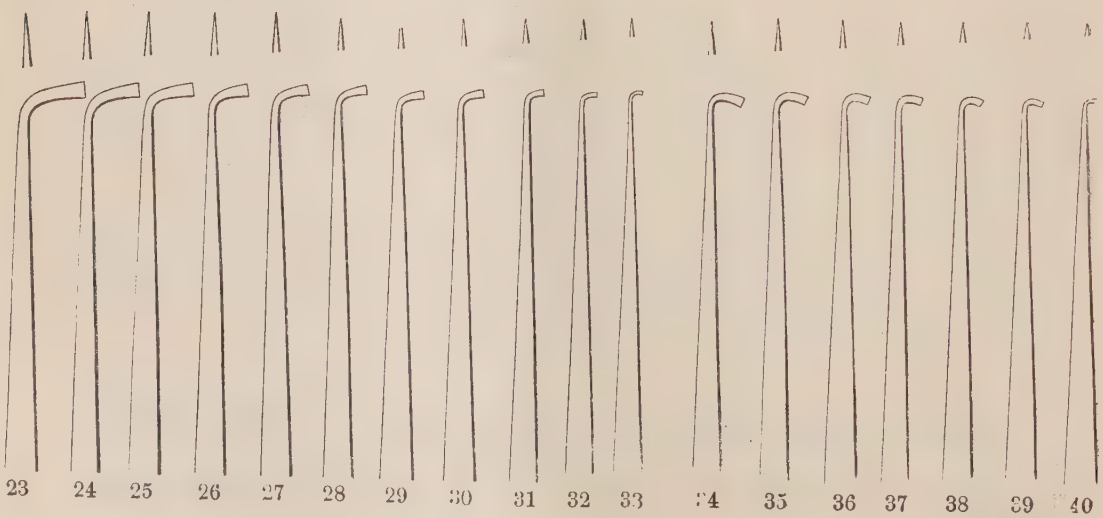
JOHNSTON BROTHERS & SELBY, 23 N. Charles St., Baltimore, Md.

JOHNSTON BROTHERS'

Excavator List.

This list is believed to be, both in number of instruments and range of sizes, by far the most complete yet published. It is not possible to print clearly from cuts as small as the small sizes of excavators made by us. We therefore say that, while the excavators are all made to gauge, and so of uniform size, our cuts of the smaller sizes do not adequately represent them.





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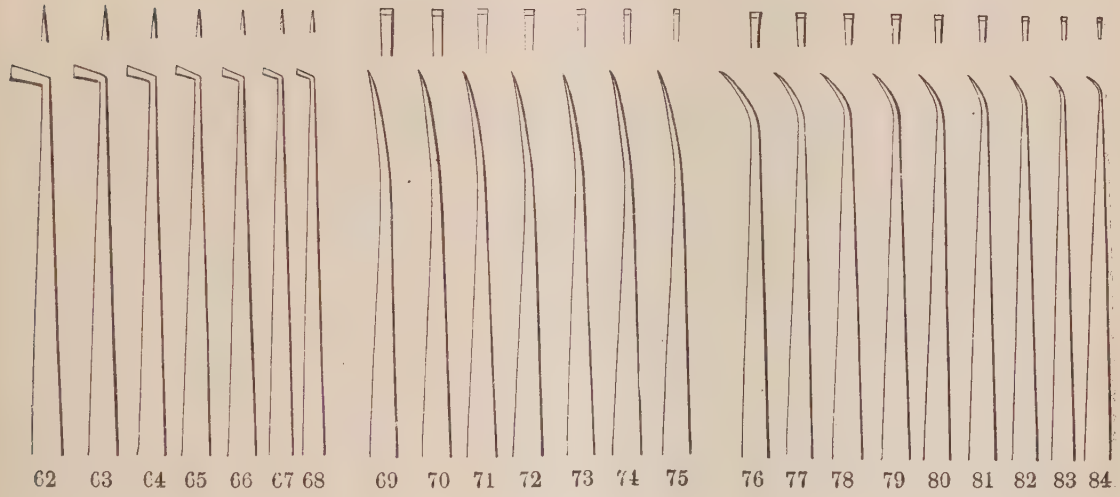
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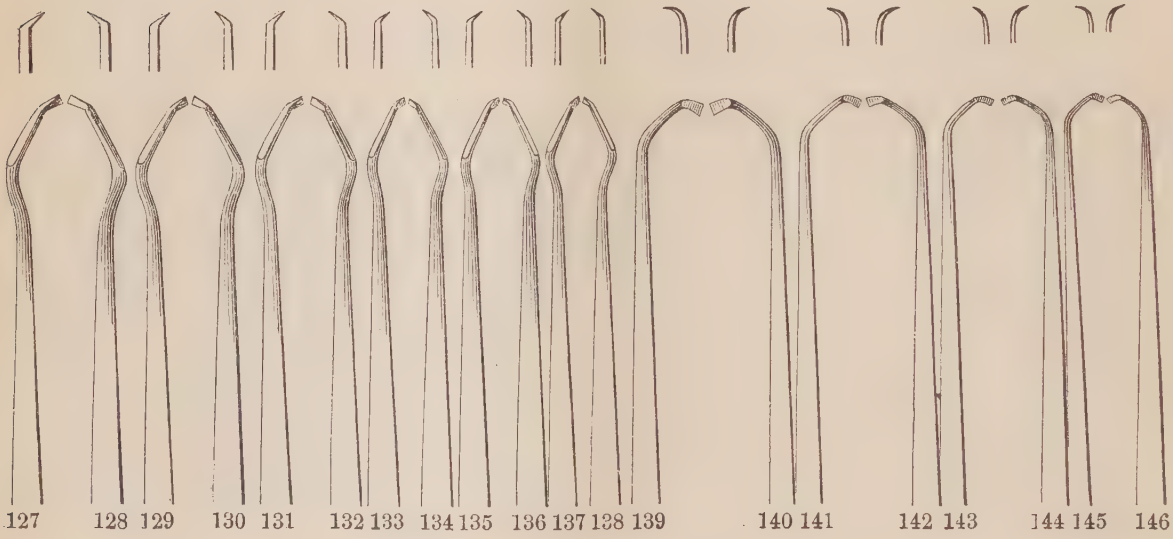
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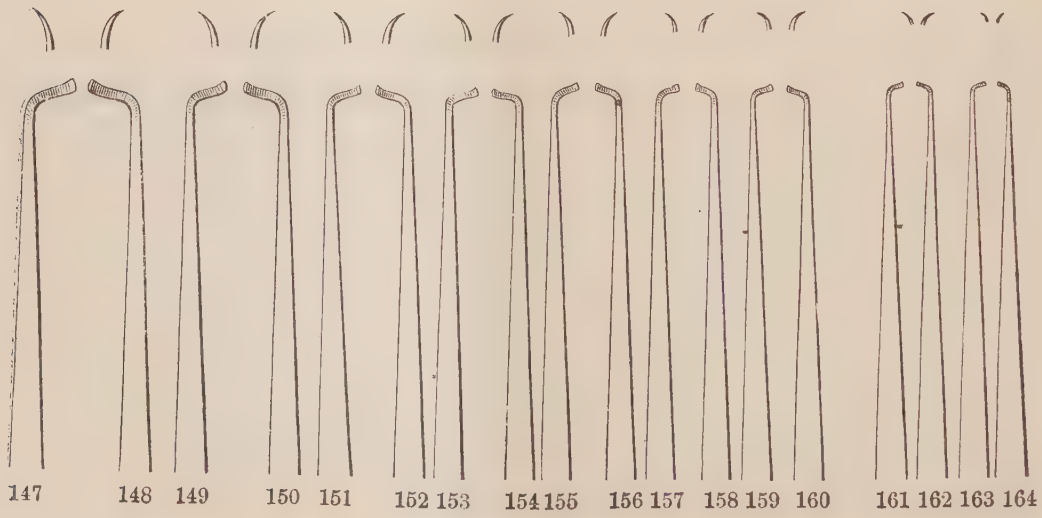
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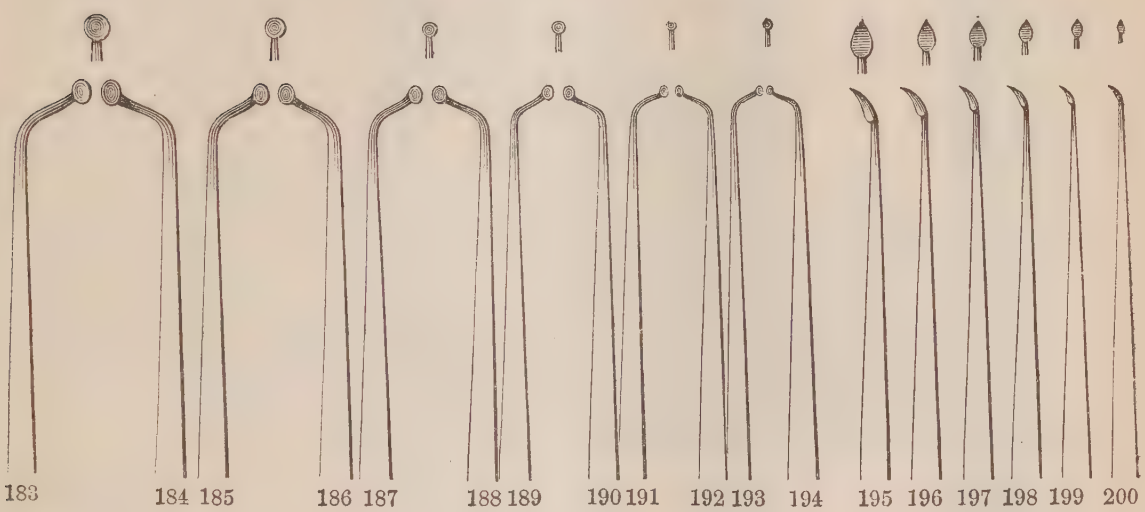
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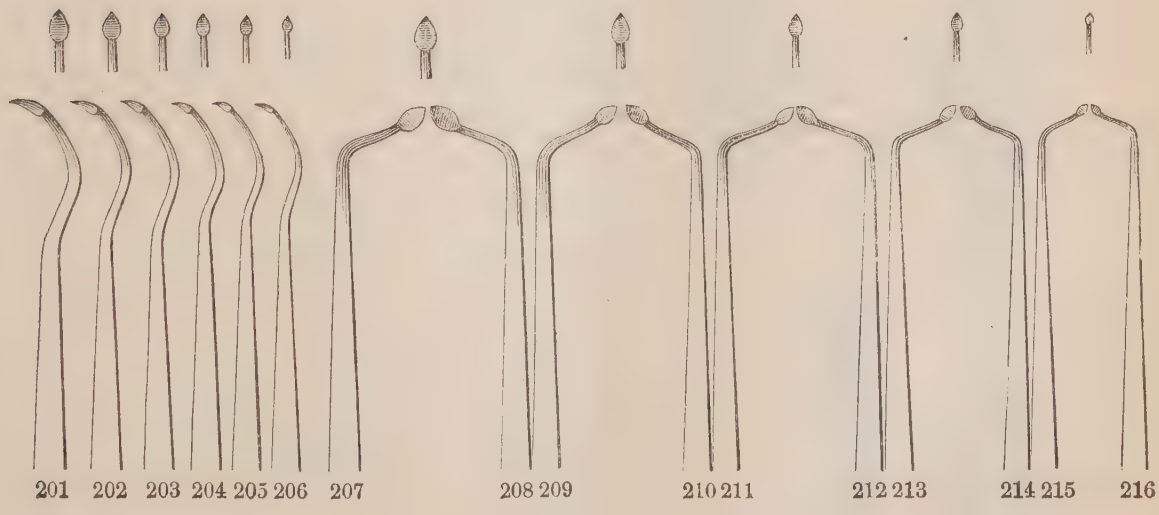
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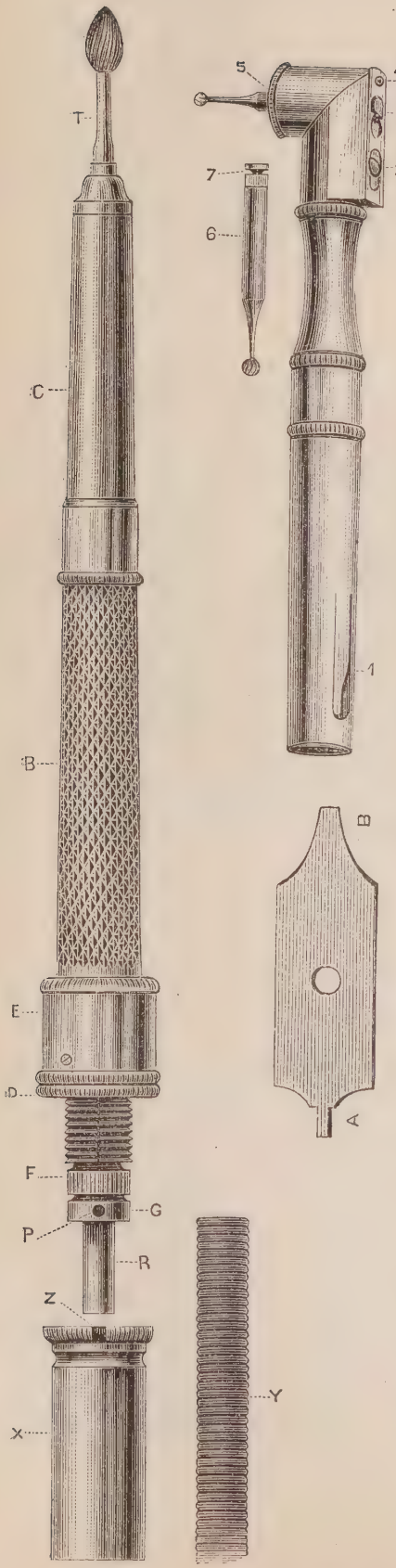
JOHNSTON BROTHERS'

Cone-Journal Hand-Piece

FOR ANY DENTAL ENGINE.

The Greatest Improvement in Dental Engines since 1872.

PATENTED MAY 18, 1877.



We advise our friends to purchase and use the Cone-Journal Hand-piece, for the following reasons:

1st. It is the only Hand-piece constructed in accordance with mechanical principles, and in such a manner that the spindle will not wear so as to run out of true.

2d. The adjustable conical journal-seat takes up all the wear on the journal, so that the Hand-piece will run as true after many months' wear as when new.

3d. Excepting only that of the suspension engine, it is the only Hand-piece which runs steady enough to carry a disk satisfactorily and without danger of breaking.

4th. It is so constructed that oil cannot find egress, either to the hand of the operator or to the lip of the patient.

5th. The conical journal at the nose of the Hand-piece is placed so far back, and is so protected, that no grit or dirt can reach it.

6th. It is the most durable Hand-piece ever offered to the profession, and will not need frequent repairs; hence it is the cheapest to buy.

It is so proportioned that the various attachments used on the Cable or White Hand-piece, can be used with this.

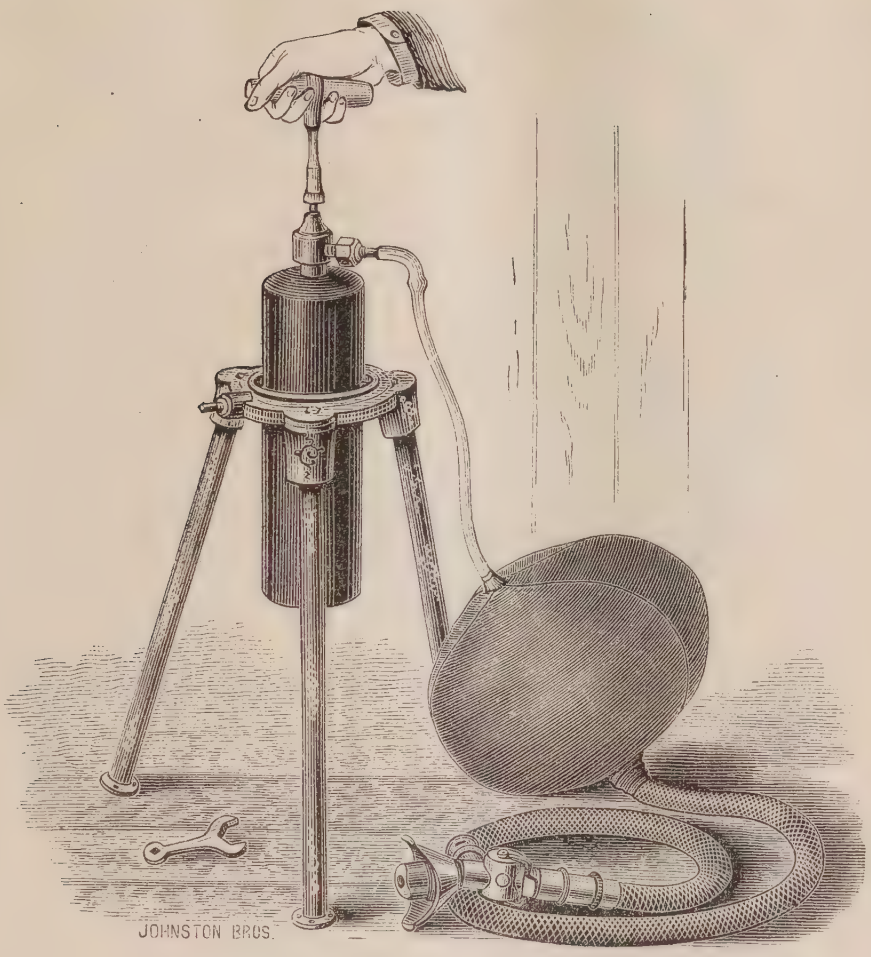
It uses our C (also the Universal) bur, and the White bur can be readily altered to use with this Hand-piece.

Send for Circulars. It is warmly recommended by Drs. CHAS. F. ALLAN, CHAS. D. COOK, GEO. L. MASON, GEO. S. ALLAN, S. G. PERRY, N. M. ABBOTT, DELOS PALMER, H. G. MIRICK, R. F. AMBLER.

Price of Hand-Piece, and one dozen Cavity Burs, $10.00.

Right Angle 5.00

NITROUS OXIDE GAS.



100 GALLON CYLINDER TRIPOD.

PRICE, $4.00.

We here show a representation of a tripod, handsomely japanned and ornamented, which is designed to hold the cylinder while in use, and is less expensive than the Morocco case, of the Surgeon's case.

Price adapted to	100	gall.	cylinder	.....		$4.00.
" " "	500	"	"	.....		6.00.
" " "	1000	"	"	.....		8.00.

ADJUNCTS NECESSARY WITH EITHER TRIPOD, VIZ.,

Bag, Inhaler, Key, Union-Nut and Wrench..... .....$17.00

For other prices of Gas apparatus, see pages following.

LIQUID NITROUS OXIDE.

N_2O

No other equally safe anæsthetic is known. While Chloroform and Ether are killing scores, if not hundreds, annually, Nitrous Oxide, although used many times as frequently as either of the other anæsthetics named, proves itself entirely harmless; and this too, though very commonly an impure article of Nitrous Oxide is exhibited. The Nitrate of Ammonia ordinarily furnished in the market is far from being chemically pure, and the products of its decomposition are too often impure Nitrous Oxide and Bin-oxide of Nitrogen. The latter is a gas of which the chemist, Brande, says:—"It is rapidly fatal to animals"—and again, (of the reddish fumes which result from its admixture with air, which fumes most dentists have seen while making Nitrous Oxide,) "These are fumes of Nitrous Acid, ($NO^2+2O=NO^4$). They have a peculiar suffocating odor, and are highly irritating and corrosive—*care should be taken that they are not breathed, even in a dilute state.*" All danger from this source may be avoided, however, by making use of *Liquid* Nitrous Oxide, which, being prepared constantly and in large quantities, under the direct supervision of a chemist, is certain to be pure. *No instance* of fatal results following the administration of pure Liquid Nitrous Oxide Gas is known. The following statistics, showing the comparative safety of several of the leading anæsthetics, have been before given by us, but cannot be too often brought to the notice of those who are constantly called upon to relieve suffering by means of these agents.

From a careful examination of the statistics of 200,893 cases, Prof. E. Andrews gives, in the *Chicago Medical Examiner*, the following estimate of the relative danger from different anæsthetics:

Sulphuric Ether	1 death to	23,204	administrations.
Chloroform	1 "	2,723	"
Mixed Chloroform and Ether	1 "	5.588	"
Bi-chloride of Methylene	1 "	7,000	"
NITROUS OXIDE	**no Deaths in**	**75,000**	"

Edward R. Squibb, M.D., than whom our country has no more able pharmaceutist and toxicologist, in a lecture on anæsthetics before the Medical Society of the State of New York, says: "Nitrous Oxide was the first anæsthetic; and the safety and certainty of its effects, even in inexperienced hands, for all momentary operations, and the promptness with which persons recover from its use, render it perhaps the most important of all anæsthetics, because destined to relieve a greater aggregate amount of pain, *with greater safety*, than any other agent."

Again—"If the surgeon considers the safety and saving of pain to his patient, first, and his own convenience in operating, second, he will hesitate before passing over such an agent as Nitrous Oxide."

It may be well just here to call attention to the fact that, when ether or chloroform is administered, it is not at all uncommon for the air about the patient to become so charged with the vapor as to somewhat affect the surgeon, taking from him perfect clearness of mental operation, and of the senses, and frequently leaving him with headache, and even nausea.

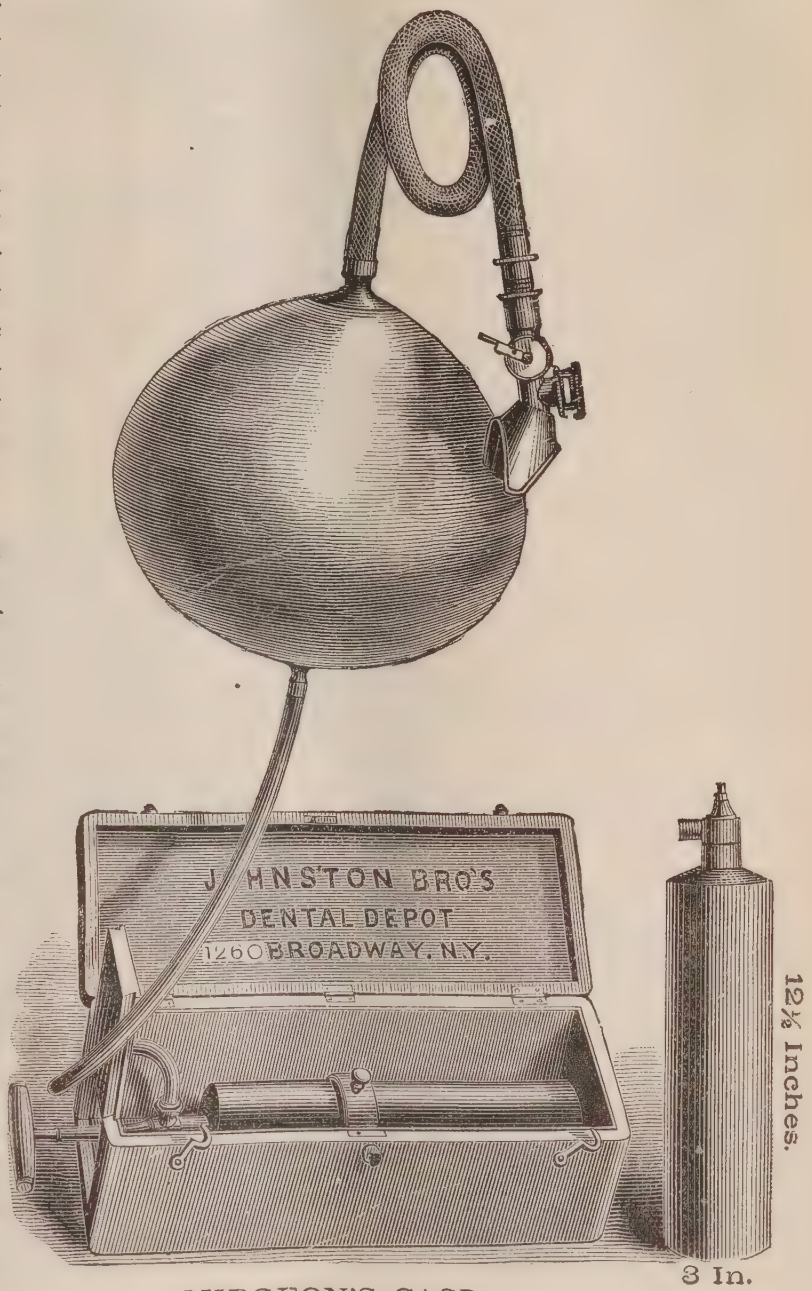
When Nitrous Oxide is given, nothing of this occurs, and the surgeon is in no way conscious of the presence of the anæsthetic, except as he sees its effects on his patient. This, we think, is a convenience to the surgeon.

Numerous and repeated trials of the Liquid Nitrous Oxide in capital operations in surgery, (as well as in momentary operations), during the two years just passed, attest the

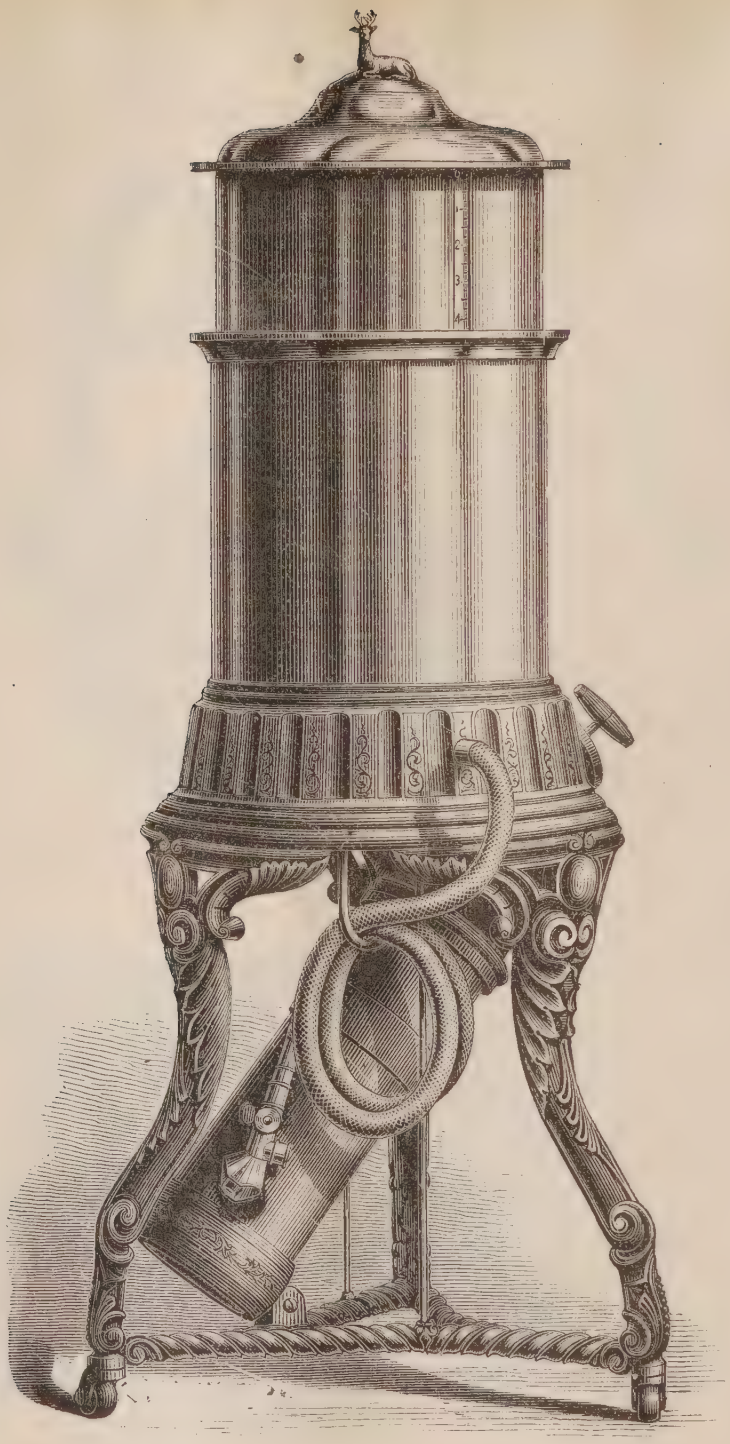
perfect adaptability of this agent to all cases where an anæsthetic is needed, and the time is not very distant when it will supplant its cheaper, but dangerous rivals.

Two styles of apparatus are provided for its administration. The most generally used, because of its cheapness and portability, is the SURGEON'S CASE.

This comprises a strong cylinder containing One Hundred Gallons of Gas; a strong morocco covered case, provided with an iron ring and set screw, by which the iron cylinder is held in place during use, and its delicate valve protected from injury; also, a rubber bag with rubber tube at one end for admission of gas, while an inhaling tube, handsomely covered on its outside, and provided against any possibility of a collapse by a tin-coated spiral of wire on its inside, is fastened at its opposite end; a metallic inhaler—nickled—having two spring valves, which answer to the slightest breath, either of inspiration or exhalation. The inhaler also has a two-way stop-cock or ground valve so arranged, that the gas being shut off, the patient may be allowed to breathe air until all alarm is dissipated, and then, by an unobtrusive movement of the fingers without previous notice, the air may be excluded and gas admitted. It contains also, a nickel-plated wrench and a nickel-plated key. In fact *all* the apparatus necessary for administering the gas. The whole case and contents weighs about fifteen pounds. This is here shown as open, and the bag which receives the gas from the cylinder, and from which it is exhibited to the patient, is represented as filled, and suspended above the case. The cylinder is also shown as standing at the side of the case. This is the simplest and most popular form of apparatus, and will be everywhere welcomed—because of its portability for use outside of the operating room.



SURGEON'S CASE.



NICKEL-PLATED GASOMETER

AND ORNAMENTED STAND

FOR LIQUID NITROUS OXIDE.

NICKEL-PLATED GASOMETER.

This style of apparatus is especially designed for those who use large quantities of Nitrous Oxide, or who may desire a highly ornamental piece of office furniture, coupled with a *really economical* gas apparatus, the gas being furnished in 1,000 gallon cylinders, at a reduction of 25 per cent. in price.

The cut on the opposite page represents the nickel-plated gasometer, mounted on a stand, with a 1,000 gallon cylinder, in position, under the gasometer.

Heretofore, gasometers have been so unsightly, that it has been considered desirable to place them in an adjoining room or behind a screen; we take pleasure now in offering to the profession a gasometer so handsomely gotten up, that it will be an ornament to any office, and at the same time so constructed, as to be vastly superior to any apparatus heretofore used. The gasometer will, when full, hold 10 gallons of gas —this is sufficient to completely anæsthetize any patient. The usual amount of gas given to a patient is from 3 to 5 gallons.

If it is desirable to keep the patient under the influence of the anæsthetic for any length of time, (as in a surgical operation), the operator has under his control 1,000 gallons of gas, by merely turning the key seen in the cut at the right. The gasometer is nickel-plated, highly polished, and mounted on a carved iron stand, which is japanned and ornamented with bronze.

On the bell of the gasometer there is a scale graduated in gallons, and fractions of a gallon, so that the operator can readily see how much gas he has administered.

Another valuable feature in this gasometer, is a peculiar water-check or valve, so arranged that though the gas will flow freely on the lightest inspiration at the inhaler, it is instantly and automatically shut off by the water when the patient stops breathing.

This does away with the necessity of closing any stop-cock, and prevents all waste of gas; it also saves the dentist's time at the most critical moment, as he has only, after having administered the gas, to lay aside the inhaler and proceed at once to operate without the necessity of shutting any stop-cock. The stand is so constructed that a small (100 gallon) cylinder can be used while the large cylinder is being re-filled.

We should also call attention to the fact, that there is no liability to loss of gas from leakage, caused by the operator's leaving the valve of the cylinder open, for if there is such escape from the cylinder, the bell of the gasometer will rise, and the operator will have his attention called to the waste, thus enabling him to correct the difficulty at once.

The whole apparatus is mounted on castors, and can be readily moved.

This apparatus is especially desirable where large quantities of nitrous oxide are used, or where it must be sent a great distance. In this form it is best to ship it by *fast freight*—which makes the cost of transportation very light. The gas can be kept for any length of time, and is constantly on hand *and always of the best quality.*

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.

Why Nitrous Oxide should be preferred to Ether or Chloroform.

1st. It is far safer—see foregoing statistics. Dr. Colton reports having administered it to thousands of patients, without a single accident.

2d. It acts quickly; from one to two minutes being generally sufficient to bring a person completely under its influence.

3d. It seldom excites a patient to violence—a matter of great importance.

4th. Nausea is not often excited, even during a long operation. Eating, however, should not immediately precede the administration of the gas. It is contended by some operators of large experience, that *pure* nitrous oxide *never* causes nausea. In operations of the eye, or in the pelvic region, this peculiarity renders the gas invaluable, and it always is of much value to the patient's feelings.

5th. The shock given to the system by other anæsthetics, is almost as severe as the operation itself, and a slow return to consciousness and the normal condition detrimental to the recovery of the patient. Nitrous Oxide frees itself from the system as speedily as it produces its effects, and so adds nothing to the perils of surgery.

6th. It is no small advantage, as before recited, that, while using Nitrous Oxide, the operator feels no inconvenience from its effects, as he does not inhale it, while he cannot altogether escape the fumes of ether or chloroform.

REVISED PRICES.

Complete Apparatus—Surgeon's Case, with Metallic Inhaler	**No. 1**	$42 00
Complete Apparatus—Surgeon's Case, with extra sized Bag and Metallic Inhaler	**No. 2**	45 00

Boxing either, $1.00.

Each complete apparatus includes a 100 gallon cylinder, filled with Liquid Nitrous Oxide.

Cylinder with 100 gallons of Gas	16 00
Refilling Cylinder	6 00
Nickel-Plated Gasometer, with ornamented iron stand	128 00
Necessary adjuncts, (including Union Nut, Key-Wrench, Inhaler and covered Tubing)	12 00
1000 Gallon Cylinder	36 00

The above cylinder may contain more than one thousand gallons—say from 1000 to 1200 gallons—for which the price will be at the rate of 4½ cents per gallon, which is 25 per cent. less than the price in small cylinders.

Contents, if 1000 gallons, would be, at 4½ cents	45 00
Morocco covered case, with ring and thumb screw, velvet lined	12 00
Polished bl'k walnut " " " " "	13 00

Of these latter we have only a limited number.

Rubber Bag, with covered inhaler tubing, (about 4 gall. capacity)	5 00
Rubber Bag, with covered inhaler tubing, extra size	7 00
Inhaler, latest style, with two way stop cock, adapted to the use of both dentists and surgeons, with connection	9 50
Key, Nickel Plated	1 50
Wrench, "	50
Union, Nickel Plated, (nut and tube), for connecting cylinder and gas bag	1 50
Covered Inhaler Tubing, per foot	50
Plated Connection to fit old style Inhaler	1 00

JOHNSTON BROS.,

Broadway, cor. 32d St., N. Y

easy movement of the hand be raised or lowered to suit the height at which the chair is placed at the moment.

2d. The normal position of its base is, say, eighteen inches to the left side of the chair, from which position its basin will ordinarily be inclined towards the chair and patient; but should the operator desire to stand on that side of his patient, the standard of the spittoon can be instantly inclined in the opposite direction, so as to be entirely out of the way

3d. Instead of a wooden case, twelve inches square, is an ornamented metal tube one and a half inches in diameter, which will not warp, occupies very little room.

4th. Movable joints are so arranged that any leakage is impossible, since the waste from the bowl never comes to the joint itself, but is discharged below, in the bottom of the lower half of the socket of the globe, and conveyed into the waste pipes.

5th. It is provided with a gold trap, and an operator of good practice now using the ordinary spittoon will be able to save enough gold in from one to two years to entirely reimburse himself for this purchase.

6th. All its bright parts are of gun metal, and its tubing silk covered.

The water jet used is the device of Dr. Redman, of Louisville, Ky.

Price.....$60.00
Boxing.....2.00

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.

The cut is a good representation of this unique chair. The acknowledged requirements of a first-class dental chair have been here secured by Dr. M. B. Wilkerson—the inventor—by methods showing great originality. All cranks are dispensed with and levers substituted for them. The chair is raised by pressure of the foot on the long lever, which hides the back foot in the cut. This operation requires very little effort, and occupies but eight seconds, and is only equivalent to stepping up eight steps. To lower the chair one has only, with the toe of his boot, to raise the lever just back of that first named, and the chair sinks rapidly and noiselessly until the lever is dropped, when it instantly stops. Except when in use the long lever folds in under the chair.

A touch of the lever in front of that just named, leaves the chair free to rotate through the whole circle. Directly beneath the seat of the chair, and close to the seat, is shown a lever, which, when pressed forward, permits the rocking movement while the lever is held, but whenever released fastens the chair in position.

Thus the three principal movements, elevation, rocking and rotation, are accomplished. The minor movements, all of great importance, however, are the raising or lowering of the back of the chair; the raising in like manner of the head-rest; the slight rocking of the seat of the chair, so as to prevent the patient from sliding forward; the adjustment of the footstool at various lengths and heights; the spring back support to rest the small of the back. This, at will, is converted into a capital child's seat.

An arm-rest is shown at the right of the head-rest. It can be secured on either side of the head-rest at will.

The whole chair is of the most substantial construction and highly ornamental. It will be upholstered in either green or garnet plush or in leather.

This is *not* an hydraulic chair. It has *no pump*, but is raised simply and solely by a lever actuated by the foot. When raised, the elevation of the central column, which supports the chair, tends to produce a vacuum in the chamber through which it passes, and this chamber is immediately filled by a column of oil, which, opening a valve at the bottom of the chamber and directly following up the central column of the chair, blocks it up whenever the lever ceases to raise it higher. Of course, whenever the same valve is tripped, the oil flows back into its receptacle, and the chair is rapidly and noiselessly lowered. *Not one drop of oil* has ever or can ever find egress from the inner base of the chair to its exterior. So much to silence constant misrepresentations of another dealer.

ADVANTAGES.

1st. It can be raised with the foot of the operator, and by a very slight effort.

2d. It can be raised in half the time of any other dental chair, except the Morrison.

3d. It can be lowered without exertion of force, and as much or as little, or as fast or as slow, as desired, by merely opening a valve.

4th. Its range of movement is superior.

5th. It has a perfect forward and backward movement, so that the patient can be rapidly inclined at any angle by a very slight exertion of force by the hand.

6th. Its arrangement for children is unique and excellent.

7th. Its footstool is readily adapted to the wants of large or small persons.

8th. Its head-rest is completely firm in any position in which it may be placed, has a large range, and is fastened by a single movement of the hand.

9th. The operator can control all its movements without once taking his hand from the mouth of the patient.

10th. It has a perfect rotary movement.

11th. By means of an adjustable foot it will stand firmly on any floor, however uneven.

We have orders for a large number, and are receiving more daily, and entering them in rotation.

JOHNSTON BROS., 1260 Broadway, N. Y.

JOHNSTON BROTHERS & SELBY, 23 N. Charles Street, Baltimore, Md.

The Morrison Dental Chair.

Comfort for both Operator and Patient, Rapid Movement, Simplicity of Construction, Great Durability.

The desirable features of a dental chair are almost completely enumerated above. The Morrison Chair answers each of these requirements more completely than any other chair made.

It contributes to the ease of the operator:

1st. By the lightness and rapidity with which the patient is raised or lowered to a convenient position.

2nd. By the form of its back, which is so narrow as to render it unnecessary for the operator to stretch to reach his patient.

3d. By permitting him to drop either arm of the chair entirely out of his way.

4th. By making it possible to operate in either a standing or sitting posture with equal facility.

It affords comfort to the patient:

1st. In the arrangement by which the lower back-pad may be moved forward to support the small of the patient's back.

2nd. The upper back-pad is readily raised or lowered, so as to exactly adapt itself to the wishes of any patient as if the chair had been made for this one person.

3d. By the readiness with which the patient may change the foot-stool from one position to another as suits their notion at the moment, and without disturbing the operator.

If desired this chair can be furnished with either the usual upholstery of dental chairs, or with Turkish upholstery—soft and with springs; or with summer seats and back—of cane; or with separate sets of all of these, which can be changed from season to season by the owner without difficulty or the necessity of employing mechanics of any kind.

Its movements are very rapid.

It can be raised from its lowest position, in which the seat is 15 inches from the floor, to its highest, 42 inches above the floor, in seven seconds. Both low

and high based chairs are here combined in one, giving a vertical range of more than two feet.

It has no equal in operations upon Children.

The child can be raised as high as needed by the tallest operator.

It is provided with a comfortable back and head-rest, exactly as is a grown person.

The foot-stool is quickly adapted to children of any size.

It is extremely simple.

The principal movements of the chair and head-rest are all under control of but three clamps, and the chair is adjusted in height by a single crank.

By one of the above-mentioned clamps it is securely fastened at any desired inclination, and all done in an instant.

It is very durable, because

1. Being made almost entirely of metal, open joints or season cracks are impossible.

2. The upholstery of this chair is so arranged that it can be renewed, by exchange of the upholstered parts, without leaving the rooms of the operator and at moderate expense.

ACCESSORIES.

CASTORS.—To secure the *rotary movement* for such persons as desire it, legs have been cast, having recesses in the feet, into which Castors are inserted. The castors in the front legs roll laterally only, so that by them the patient's face may be turned to the light. When in the right position a locking device permits you to fasten the castors so that they cannot be moved until unlocked. The castors in the back feet are so placed as to revolve only back and forward, so that while they permit you to easily roll the chair like a wheelbarrow out of position if you wish to sweep, they cannot be moved by the force exerted in plugging a tooth.

NARROW BACK PAD.—To be used sometimes instead of the top pad, and sometimes as a third pad when the back of the chair is stretched to full length.

SPITTOON ATTACHMENT—see in the cut—is a cheap and convenient substitute for a separate spittoon. Is more convenient and costs less.

HEAD-REST.—The Morrison Head-Rest is a *thoroughly* good one, and as pictured on the chair has given general satisfaction. It is supplied with the chair if we are not otherwise directed, and the price of the chair as named includes this rest. The Johnston Head-Rest is *our latest*, and is everywhere approved. It can be had with the chair at an extra cost of $8.00.

EXTRA UPHOLSTERY.

Turkish Upholstery.

Some persons having desired a softer style of upholstery than is usual in dental chairs, we have adopted, after many experiments, a modification of what is usually known as the Turkish chair. The seat is made about four inches higher in front than at the back, and both it and the lower back are made very soft by the liberal use of steel springs and hair, the edges being kept full by a piece of heavy spring wire which is built into the upholstery.

The perpendicular edges are covered with a puffing to match, and "set off" with handsome silk cord.

The arms and upper back pads are made heavier than usual, and are puffed and corded to match the seat.

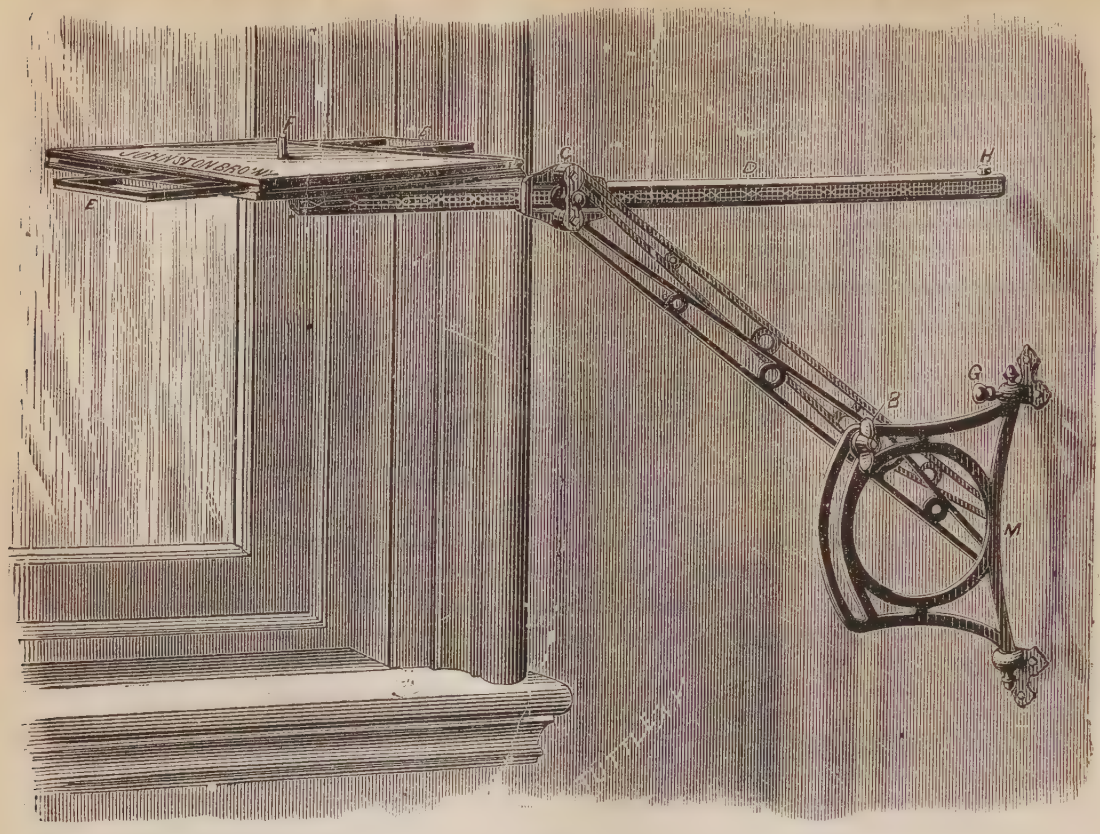
Real Morocco.

We also have produced a very elegant article by the use of real morocco, handsomely embossed. It is durable and particularly desirable for warm climates.

PRICES.

In fine green or garnet plush—with Morrison Head-rest	$ 150.00
Boxing	5.00
To which price add, if ordered:	
With Castors	10.00
With Johnston Head-rest, instead of Morrison	8.00
With extra back-pad	4.50
With spittoon attachment and porcelain cuspador	8.00
With nickled metallic cuspador and gold trap	10.00
With nickled metallic cuspador and gold trap, and nickled spittoon attachment	18.00
With Turkish upholstery	15.00
Real morocco embossed	10.00

MORRISON • DENTAL BRACKET.



PRICES.

With Black Walnut Table, 12 inches square.....$25.00.
With Rosewood Table, 14 inches square, and Velvet Top, and Drawers about five-eighth inch deep, lined with Leather..... 40.00.
The Rosewood Table alone, as above, to fit any Morrison Bracket..... 17.00.
Boxing.....$1.00.

The cut represents the table in its highest position, and distant from the wall a little more than half the distance it is capable of taking. By loosening the thumb-screw B, and allowing it to rest in the bottom of the slot, (instead of at the top as represented here,) the table will occupy a position as much below M as it now does above the same point. The extreme range, that is, the distance between the table when at its highest and its lowest position, is 24 inches.

M represents a metal frame which is secured to the wall or other support by screws. It swings from side to side as a gate on its hinges. C. M. represent light but strong metallic arms, hinged at M as a centre and moving up or down. At B is a thumb-screw passing through a slot in the frame M. By it the arms can be firmly clamped at any desired height.

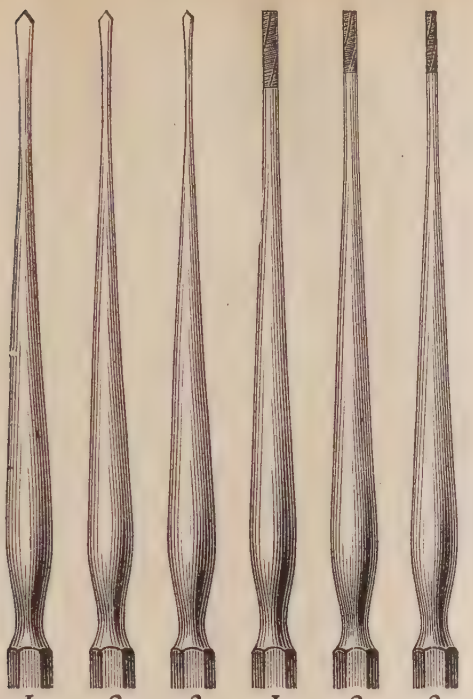
At C is a slide-rest through which the hollow rod D passes freely, and may be clamped at any distance from its ends. At one end of this bar a square table is supported, having in it foil and instrument drawers. This table is capable of rotation round F, which is the burner of an alcohol lamp, the alcohol being contained in D and introduced at its further extremity H. Among the advantages of this bracket are these:

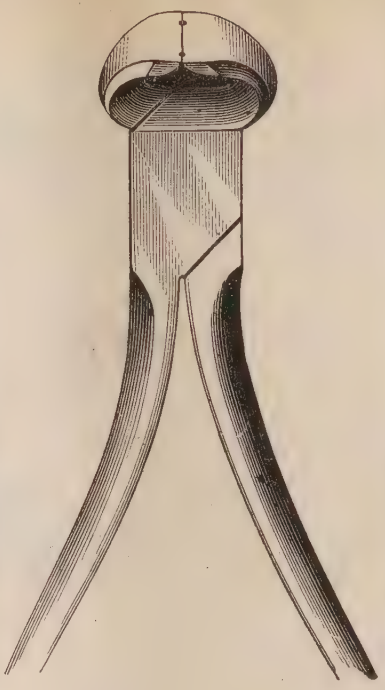
1st. It combines a greater variety of range and movement than any other.
2d. It is rigid in whatever position it is clamped, and will hold 15 lbs. with steadiness.
3d. It provides a clean receptacle for foil and instruments.
4th. It is obvious that a square table is very much more convenient as an instrument stand than a round one.
5th. Its drawers extend through the table and can be opened from either side.
6th. To those having a Morrison Chair it is almost indispensable, as it will follow the chair to either its lowest or its highest position.

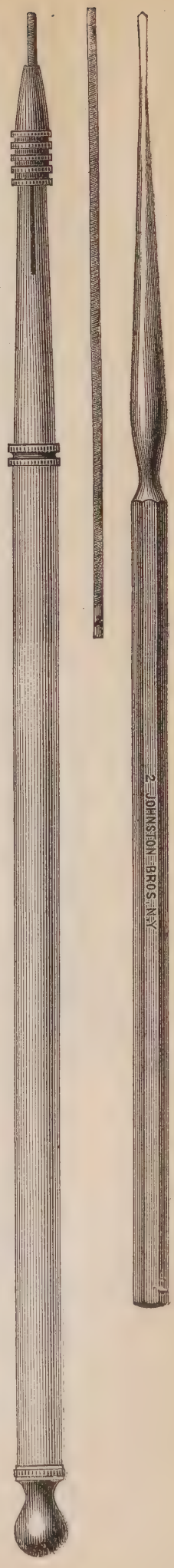
It is handsomely ornamented and nickel-plated throughout, so that it is a very beautiful addition to the furniture of the operating room.

JOHNSTON BROTHERS,
Broadway, cor. 32d St., N. Y.

Morrison's System of Retaining Screws.







Dr. W. N. Morrison, of St. Louis, has furnished us models of his drill-taps and adjustable wire-holder, and gold wire, from which we have reproduced similar instruments or apparatus for the profession.

No especial description is needed in view of the thorough work of our artist. It may be well to call attention to the following facts: The drill-taps and wire fitted for each other bear corresponding numbers, as, 1, 2, 3.

The adjustable wire-holder takes either size of wire.

The cutting plyers are provided with two round openings in their cutting face. The long wire to be used if put in one of the openings can be "nicked" at the proper distance to form the screw while in the wire-holder, so that after having been screwed into place it may readily be broken off, without the use of file or plyers in the mouth.

In the above numbers of Drills, Taps or wire:
No. 1 corresponds to Mack's No. 0.
No. 2 " " No. 3.
No. 3 " " No. 1.

We make no number corresponding to No. 2 of Mack's system, it being very nearly the same size as No. — of Morrison's system.

PRICES.

Complete Set, including three wires, 3 inches long, with morocco case ..... $12.00.
Wire-holder, nickel-plated ..... $1.50.
Drills, each ..... 50 cts.
Taps, " ..... 50 cts.
Nippers, nickel-plated ..... $2.00.

	No. 1.	No. 2.	No. 3.
Gold rods, each	$1.50	$1.20	$1.00.

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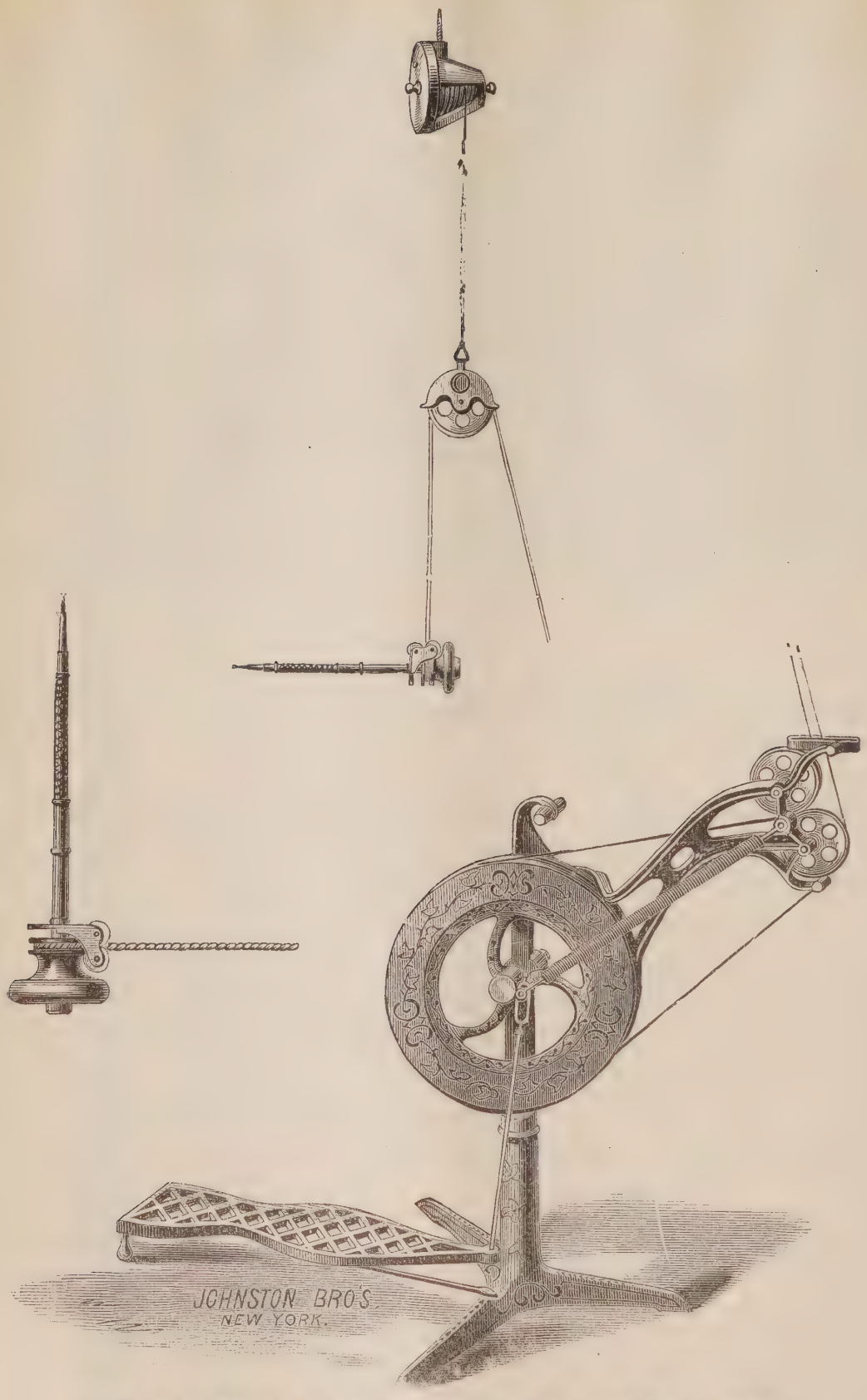
Broadway, cor. 32d St., N. Y



SUSPENSION DENTAL ENGINE.

(Dr. ELLIOTT'S INVENTION.)

Price, $50.00. Right Angle Attachment, $5.00. Boxing, $1.00.

SUSPENSION DENTAL ENGINE.

(INVENTED BY DR. W. S. ELLIOTT.)

The Dental Engine represented in the accompanying plate is confidently recommended by us as sure to give general satisfaction.

Two or three years ago a few engines modeled on this, the Elliott, plan (suspension from the ceiling) were sold. Though imperfectly constructed, they have been uniformly commended by those who have used them.

Each of the two styles of Dental Engines which have found favor with the profession has advantages peculiar to itself.

In this form the driving power is belted directly to the shaft of the hand-piece, without the intervention of a flexible joint, and so *entirely avoids all the unsteadiness* or "chattering" which is almost inseparable from the flexible joint, even when short, and is unendurable where the non-rigid portion is long.

The Remodeled Engine, shown in our cut, has not only greater elegance of design than the Suspension Engine as previously sold, but, by its construction, obviates several objections to which the earlier model was liable. It was previously necessary to make the hand-piece large and heavy in order to give tension to the belt, and in furtherance of this purpose a considerable ball of metal was suspended from the rear of the hand-piece. As now made, the ball weight is dispensed with, the hand-piece being balanced and tension given to the driving-belt by placing a small pulley on the hand-piece spindle. The hand-piece is reduced to half its original weight, *and the slightest movement at its point can now be felt by the hand which guides it.* Among its advantages, those subjoined are prominent.

1st. It is more steady in its movement than any Engine made.

2d. Being suspended on a cord, it is free to move in any and every direction—hence the bur can be readily applied to any cavity, whatever may be its position in the mouth.

3d. It has an abundance of power.

4th. It is not easily broken or likely to need repairs.

5th. It is, above all others, a "*light running*" Engine.

6th. The hand-piece, which formerly was particularly objectionable because of its size and weight, and because of the position occupied by the weight needed to balance it, is now scarcely larger than that of the Morrison Engine, and is fitted to use the same (C style) bur. For the balance-weight we have substituted *a fly-wheel on the shaft which carries the bur.* While keeping the hand-piece well balanced, this gives momentum and greatly increased steadiness to the cutting instrument.

Orders for this Engine will be entered in rotation as received, and promptly filled.

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1877–78.

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Students may matriculate at any time, as the Infirmary is open for regular students of the College to practice in the entire year.

The regular course of Lectures will commence on Tuesday, October 2d, and continue until the latter part of February. Three hours of each day of the week (except Saturday) will be devoted to Lectures, and four hours to *Clinics,* and practice at the Chair and in the Laboratory, under the direction of the Demonstrators.

Our Infirmary is furnished with twenty-four good chairs and all the appliances. Our Lecture-room will seat, and our Laboratory accommodate, two hundred students; all on one floor, and up one flight of stairs only. There is seldom any lack of patients for students to operate upon.

Tickets for one year's Instruction, including Course of Lectures, Matriculation, Demonstrators', Diploma Fees, and practice in the Infirmary the seven and one-half months between the sessions...	**$150.00**
For the Course of Lectures only	**100.00**
Matriculation	**5.00**
Graduation Fees	**30.00**

Board may be obtained for from $6 to $8 per week.

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DENTAL DEPARTMENT.

BOSTON, MASS., 1878-79.

The plan of study of this School has been radically changed. Instead of the usual oral examinations at the end of the course, written examinations are had at the end of each year on the subjects pursued during the year, and instead of the customary repetition each year of the lectures and studies of the preceding year, the course is progressive over a period of two years, and the student is required to pass a satisfactory examination in the first year studies before being allowed to proceed to the next. At the end of the course a satisfactory examination must have been passed in all the subjects.

The new year begins Sept. 25th, 1878, and ends the last Wednesday in June, 1879. It is divided into two equal terms, with a recess of one week at Christmas, and another in April.

The University Degree, D.M.D. (*Dentariæ Medicinæ Doctor*), is conferred upon those who fulfill the requirements.

FEES.

There are no fees for matriculation, for the diploma, nor for the demonstrators. For the first year a student is a member of the school, the fee is $200; for the second year, $150; for any subsequent year, $50.

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The Manufacturer says of it: The Amalgam is composed of materials which the dental profession at large recognize as the best (except gold) for filling teeth. It is of finest quality. It has the merit of becoming hard in fifteen minutes after being prepared for use, and does not change color or shrink.

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⅔ oz. " " "	2 00
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PATENT APPLIED FOR.

For finishing fillings, a new and unequaled polishing material.

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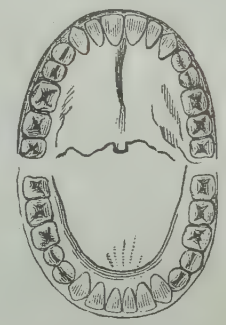
HENRY I. DORR, D.D.S., Demonstrator.

THE DISPENSARY and Laboratory open all the year.

Spring Course of Lectures will commence on the first Monday of April, and continue until the last of June. *Fall Preliminary Lectures*, commencing Monday, September 4th, will continue daily until November. Like the Spring Course, their object will be to anticipate subjects presented during the Winter Session. *The Regular Winter Course* commences Monday, November 6th, and closes on the last day of February ensuing. Three hours of each day will be devoted to attendance upon lectures, which will be illustrated to the fullest extent by a large and valuable collection of Chemical and Philosophical apparatus, and Anatomical and Pathological specimens. Tickets for the Course, including the Demonstrators', $100; Diploma, $30; Matriculation (paid but once), $5. For further particulars address

J. H. McQUILLEN, Dean, S. W. Cor. 21st and Arch Sts.

WEDNESDAY, ... 18 .....

Time.	NAME.	OPERATION.	Amount.	RECORD.
				

THE DENTIST'S APPOINTMENT BOOK AND POCKET RECORD,

Of which the above is a sample of one day, contains the requisite blanks for a full year, exclusive of Sundays, and is so arranged that it may be commenced at any time. The first blank column, headed "time," is for inserting the hours of appointments. The next is for the "names," and if necessary the addresses of appointees. The next for entering the kind of services rendered or to be rendered; then one for the fees in dollars and cents, and the last a diagram of the mouth on which to record the exact parts operated upon. Where several operations are recorded on one diagram, draw a fine line from the point indicated to the margin, and mark on it the hour opposite the patient's name.

When examinations are made previous to appointments, it will be found very convenient to record them, so that when the patients present themselves for operations or treatment, a reference to the "Record" will render another examination unnecessary, thus saving much time.

Believing that this little *Appointment Book and Pocket Record* contains more labor-saving conveniences for the dentist, and in a more complete and simple form than any other extant, I offer it to my fellows in dental practice in the full belief that their professional labors will be made more pleasant by its use.

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1878.

JOHNSTONS'

DENTAL MISCELLANY

A MONTHLY JOURNAL

OF

AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL AND MECHANICAL LITERATURE.

Its Contributors are Eminent Writers and Practitioners.

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It will contain illustrated articles from Dr. NORMAN W. KINGSLEY, on the treatment of Cleft Palate, Deformities of the mouth, Regulating of Teeth, &c.

The commendation of the Miscellany, received during the last year, has gratified its publishers greatly. They purpose to make the volume for 1878 superior in all respects to either volume that has preceded it. This will be—

1st. Through more frequent contributions from the regular writers who have hitherto favored it, and by promised essays from equally capable practitioners, who have not as yet written for its pages.

2d. By the further reproduction of engravings upon dental subjects. Three such have already appeared, and others are in course of preparation.

3d. By the constant search for, and publication of, items of office practice, which serve to show the methods adopted by eminent and experienced dentists to overcome the little perplexities of every-day practice, and to shorten the operations in both laboratory and operating room.

4th. By the reproduction of matter of especial interest which may appear in Foreign or comparatively inaccessible publications.

In short, it shall be the constant effort of the editor and publishers to make the **DENTAL MISCELLANY** of practical value to every actively employed dentist, as well as a source of literary enjoyment to its scientific readers.

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VOL. 5. No 50.

Johnstons'

Dental Miscellany,

A MONTHLY JOURNAL OF

AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL AND MECHANICAL LITERATURE.

FEBRUARY, 1878.

NEW YORK:

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FOR 1878.

It will be the aim of the publishers to not only maintain the character the MISCELLANY has acquired, but, by increased care, to make it more than ever an object of desire, if not a necessity, to every practitioner in the country. We have promises of articles from a number of dentists of national reputation, and do not doubt that the volume commenced with this number will be an improvement on either of the four which have preceeded it.

We invite contributions of practical articles from practical men.

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Our Depot in Brooklyn (for Retail trade), is at 340 Fulton Street.

For New York, Wholesale and Retail, at Broadway cor. Thirty-Second Street.

JOHNSTON BROS., 1260 Broadway, N. Y.

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JOHNSTONS'

Dental Miscellany.

Vol. V.——*February, 1878*——No. 50.

DENTAL EDUCATION.

By Prof. T. H. Chandler, of Boston.

Read before the Merrimack Valley Association.

The Dental literature of the day—viz., the dental magazines, show, as the way of the wind is shown by straws, that the mind of our profession is strongly exercised about its education. There is now hardly a number that has not a long article (often showing the need of its author for what he advocates) or a paragraph or two devoted to this subject. We all assent in a general way to the proposition that the world would be better for a good education, and particularly, if specialists, as Dentists, would take the trouble to "post themselves" in their own specialty, and know somewhat of what they profess.

Like the congregations in our churches, we are all more apt to apply the preaching to our neighbors, than to take the application to our own persons and cases. In truth, few persons have a "realizing sense" of what a good education really is. Our vision is more or less limited by our own acquirements. As Gulliver seemed a giant to the pigmies—so he seemed a pigmy to the giants. Americans, from the nature of our circumstances and surroundings, have in the past, not long past, been compelled to be many sided. This has forced on us, in accordance with the principles of evolution, a quickness of parts, a nervousness of temperament, a hot-house smartness, that renders us impatient of all

that is of slow and gradual accretion, as anything like a thorough education in any branch of knowledge must necessarily be, and we are slowly coming to acknowledge this fact to ourselves, loath as we are to act upon it. At the east, where the population has begun to take on the fixedness of character belonging to old communities, our ideas upon education and educational institutions partake of the change and are assuming the forms and making the demands upon students required by it.

But at the west, where society and institutions are comparatively new, and the whole community is in a more or less transition state, short time and quick work are demanded, even if it is therefore temporary and superficial, relying upon time and the "smartness" of the individual to make up the deficiencies. This applies especially to what is material, but is carried by force of habit and association over to things mental and spiritual. The fact remains, however, both east and west, that there can be no good education in any branch of knowledge without the devotion of enough *time* to imbue with its spirit and become part and parcel of its possessor. That is not necessarily or probably a good education which includes a multitude of subjects, covering a large field in the fruitless endeavor to learn a little of everything. The more numerous the subjects the more likely is the knowledge of them to be superficial and useless. A *thorough* practical understanding of a *single* subject may even be said to make its possessor well educated.

There is an ancient saying, "Beware of the man of a single book," meaning that he who had completely mastered *one* book and all that it could teach, was a man to be feared in the disputations common among the learned when the saying originated. But, in our day, it is not or should not be books we should master to complete our education. They are well enough as helps, showing the steps others have taken and pointing out the way. *Mere* book-knowledge is no knowledge. To-day our learning should be eminently practical. Books culture and refine the intellect, but it is the hand and eye of the worker that aids in the material progress of the world. Where but one can be had, by all means let it be the last. The subjects to be mastered are nature's laws, as developed in her works, and whoever understands one of these laws and its workings in all its relations is a *well* educated man. Narrow as such a path would seem at first thought, it is by no means so. It is shut in and circumscribed by no high walls or impassable barriers, but all along its course are pleasant by-ways opening into other fields, and

here and there wide vistas over the whole range of human learning, affording glimpses which vivify the intellect and refresh and rest us in our pilgrimage.

So intimately connected are all the laws of nature that he who knows one well knows more or less of all ; but, so immense has been the progress of the natural sciences in the last fifty years, that it may now be said to be the work of a life time to become well acquainted with any one of them ; therefore we see them already being cut up into divisions, and specialists are attacking these as formerly the main subjects. This being the case, how worse than useless is that teaching which still strives to impart a smattering of the rudiments of many sciences, hoping against hope that some of them may prove the fruitful stock from which will spring the future erudition. Such effort is time mis-spent, effort wasted, intelligence confounded. Continued effort in one chosen path is the course to be adopted, rather than that division of labor indicated by the proverb of "too many irons in the fire."

Until within perhaps the past fifty years it has been easily possible for a man of vigorous intellect to become master of the whole field of human learning, and the farther we go back over the progress of time the smaller are the accumulations of the past and the less the call upon effort to acquire a knowledge of the whole.

Socrates, Aristotle and Plato, men who have moved the world, and whose influence still weighs, were not troubled by what we now call education. *Their* studies were the present ; *their* past was but the past of their own country, handed down mostly by tradition, and reaching back but a few hundred years. There was then no printing press to stereotype all knowledge, to gather up and preserve the history and inventions of their predecessors and teach by their example. Brief inscriptions on monuments taxed neither their memories nor their reason.

Their literature was scanty, but of the best—those great masterpieces which have come down even to our day to instruct and delight. This was ready to their hand, and had not to be culled with time and patience from an immense mass, the accumulated dust heap of the ages. A description given by Socrates of the education of Alcibiades, one of the ablest, yet most unprincipled men of his time, will serve to give an idea of the amount and kind of schooling then thought enough for a "finished" education, viz., "Reading, writing, to play upon the Kithara, and to wrestle," a sufficiently meager description according to our modern ideas. So far, then, these ancients had the advantage of us ;

they had not to spend their lives in the mere acquisition, the climbing up the ladder of learning to the point reached by their predecessors, before they could strike off for themselves. This getting to the starting point is now no light task, but this difficulty does not excuse from the effort nor permit us to lie supinely on our backs, satisfied with our ignorance. Nor yet should we be satisfied to cull the ideas of other men, the results of their investigations, and by an effort of memory to call them ours, and ourselves educated. Cowper refers to such in the lines :

> " Thus men, whose thoughts contemplative have dwelt
> On situations that they never felt,
> Start up Sagacious, covered with the dust
> Of dreaming study and pedantic rust,
> And prate and preach about what *others* prove,
> As if the world and they were hand and glove."

Nothing is knowledge for us that we have not worked out ourselves ; we are not even entitled to an opinion upon any matter we have not come at originally by our own efforts, or in confirmation of the researches of others. How many of us are there who can thus claim what we pretend to know ? How many of our ideas, picked up from reading, will stand the tests of investigation and experiment ? And yet we call this *knowledge* and pretend to *know.*

As we are all too lenient to ourselves or too inert to begin any such course of studies as the recognition of these truths would demand ; as we are satisfied with superficial acquirements, mere book-knowledge, which glides easily into the memory and off from the tongue, even deceiving ourselves into the belief that we know all we talk, so we are inclined not to ask much from others, to take everybody at his own valuation and not scrutinize too severely the metal of which they are composed. Hence the paucity of our literature. Men who had really anything to say, any gospel, would not be backward in delivering it. Now each number of our magazine is practically a rehash of each and all preceding numbers. Every meeting of our dental societies is a virtual repetition of those gone before—the same subjects, the same thoughts, almost the same words, month after month, and year after year. Does some strong mind give birth to a new thought, it is not made a stepping stone to further truths, but as the gardener propagates a variety by passing round slips or cutting, so is this passed around, and it is always the same thing or worse from improper cultivation, never better, never improved upon. And so it is in the matter of the educa-

tion of the young men who are crowding into our ranks. We all clamor for a high standard. We ask for a medical education, or a good foundation in the primary and fundamental branches of medicine. We say no dentist is fit for his work who is not well informed in all the phenomena of the life and health, as well as of the decay and death of, the human organism. With our pens and our tongues we demand this, but how do we act it in our lives?

Is there a man among us who has come within sight of this standard, or who is making any effort to attain it? Are we not all supine and inert, willing to talk but not to work, willing to acknowledge the right, but never to put out a hand to reach it? Willing to let others take the laboring oars, and then to make it a hard pull for the rowers? When asked by a young man for our advice, does our reply always take the color of the opinions we profess, and are the opinions we profess with our mouths those we really hold in our hearts? There is a fashion of opinions as of dress, and a fashion of half earnest striving after other men's ideals. But how does such half earnestness affect the lives of those that have it or those of their kind? Instead of a help in any good cause, it is but an obstruction, weakening the workers from sheer discouragement.

In this connection I had meant to say a word or two upon the matter of our dental schools, but time presses. I will merely say that the time-honored systems have had their day, and should advance with the progress of the age or fall out of the ranks. The age of a falsehood can never make it a truth; neither can the past usefulness of a false method ever make it a true one, though many will always be found to adhere to it through sheer conservatism and inability to recognize the facts. Conservatism is a good thing in its way, but when it not only holds back the too rapid, but hinders the slow and earnest mover, it is no longer conservatism, but obstruction, and should be recognized as such.

"The streams of knowledge should be aided in their flow, and he who thirsts should not wait for them to cross his path, but should eagerly seek them at their sources and drink freely of their abundance. All help and guidance should be availed of, and if there is none to be found, even then he should not despair, but still pursue his end." "He who aims at the sun shoots high." "Nothing that is worth having was ever got without effort," and so on. I might quote proverbs without limit, all tending to the same thought—viz., the necessity of labor to attain a valued end, and that the end would be little valued were it not for the labor.

AN ESSAY FOR THE PREVENTION OF CRUELTY TO PATIENTS.

BY J. F. ADAMS, WORCESTER, MASS.

(Read before the Massachusetts Dental Society.)

The subject chosen for this paper is one which has been but little discussed in our societies, so far as I am aware, and on which very little has been contributed to the dental journals. In looking over nearly a hundred of the different magazines not a single article was found devoted exclusively to the consideration of ways and means for lessening the amount of pain in dental operations. If the public could be represented in our literature and upon our executive committees, probably this subject would figure largely among our topics for discussion. The profession has made great advancement during the last ten years. New methods and modes of practice have constantly been coming up for our consideration; our inventors have deluged us with new machines and appliances for lightening our labors and improving the character of our work; and we have been so earnest in the laudable desire of saving teeth, that some of us seem to be in danger of losing sight of the fact that it is also important to save the patient. The salvation of a tooth is an important matter, but the operation of saving it should be so conducted that at the end the services of the undertaker may not be required. We all know, and our patients know, that teeth cannot be thoroughly filled without inflicting pain, and oftentimes severe pain; but the fact that they expect to be hurt, is no excuse for any carelessness on our part. Our duty to them, in this respect, demands constant watchfulness to guard against that contempt for pain which is too often bred by familiarity. We are constantly in danger of growing indifferent to the suffering which we inflict, and of forgetting that the organs upon which our operations are performed contain the most sensitive nerves in the body. Not to consume your time with remarks of a general character, and to make this paper a practical one, I will take up the subject in detail, and ask you to follow me through the steps necessary to be taken in some of our commonest operations; not with a view of showing how these operations should be performed, but hoping to offer a few suggestions which may result in the prevention of some pain. We

will take, for example, the filling of proximal cavities in bicuspids or molars. Our first step, if the teeth are in close contact, will be to obtain space, and we have three methods from which to choose :

1st. Immediate wedging. 2d. Separation by gradual pressure by means of wedges, rubber, tape or cotton 3d. By cutting away the substance of the teeth with the file, chisel, or disk.

For producing immediate separation we have what is known as heroic wedging, and an instrument called the Jarvis separator. Of the latter I cannot speak from personal experience, but should think there might be cases where but little movement of the teeth was desired, in which it could be used to advantage.

Of the former practice, that of pounding in wedges with a mallet until they can be driven no farther, or, in the language of a celebrated advocate of this method, till the mallet rebounds, it may be said that the heroism is all on the side of the victim who sits and endures the pounding ; and it demands that the patient should be, as the operator quoted desires his patients to be, "terribly in earnest."

It has been claimed by the advocates of this method that the pressure produced upon the dental nerves by the sudden movement of the teeth, paralyzes them to a certain extent, thus lessening the pain of excavating; but could not the same result be produced by a blow on the head with a heavy hammer, and with much less suffering to the patient?

Occasionally it has been found that this paralysis has become a permanent condition, a dead pulp being the result of the violent treatment, and where this is not the case the teeth often remain sore and uncomfortable for months afterward.

If there are any members of the society present who are practicing this method, who have never experienced the sensation upon their own teeth, let them have a clinic among themselves before the close of this meeting. It may be the means of preventing some cruelty to their patients.

Having, it is hoped, made clear that the writer is not in favor of heroic wedging, we will next consider the process of separation by gradual pressure. In this, care should be exercised that the substance introduced be not too thick, as carelessness in this respect may result in severe pain, with, perhaps, a sleepless night for the patient. There will necessarily be more or less discomfort and annoyance attending the process of separating, but there need be no actual pain, or any great amount of soreness.

In most cases sufficient space can be gained in three or four days, and if two or three days more be allowed for the tooth to rest, the slight lameness existing will usually subside and the tooth be ready for filling. Where rubber is used, as soon as the space is obtained it should be removed and its place supplied by some unyielding substance, as the elasticity of the rubber permits the constant motion of the teeth in occlusion of the mouth, and will keep up the soreness as long as it remains. Hill's stopping is a good material to use for this purpose. If, in the case before us, we decide to separate by cutting away the teeth, we have three instruments for the purpose : the file, the chisel, and the Arthur disk. In the good old times, the file was the main reliance, and coarse rasps were vigorously used for the purpose ; and though there is usually no very severe pain attending their use, the sensation produced is commonly described by patients as "horrid," and, according to the experience of the writer, the expression is none too strong. Fortunately there is very seldom any need of such instruments being used, though a *thin* file, never thicker than No. 1, is generally necessary to open the way for the chisel or disk, one or both of which will effect the separation much less disagreeably than the coarse file. In case of extensive decay, leaving thin walls, no file is needed, except for smoothing the edges after the teeth have been cut away. Having effected a separation, suppose we find two large cavities extending high up beneath the gum ; our next move will be to obtain free access to all parts. How shall this be done ? Evidently in the case under consideration a wedge cannot be pushed through from the buccal to the palatal side high enough to expose the cervical walls of the cavities, without passing through the gum and coming out somewhere in the roof of the mouth. To obviate this difficulty, a writer in one of the dental journals recommends passing a lancet through between the teeth, making a cut extending up to the alviolar process, and through this cut pushing the wedge. If it is found not to be high enough, a second is introduced over it, and the first is removed —a third or fourth is inserted in the same manner if necessary !

Such treatment as this would scarcely be admissible in the case of a mother-in-law ; but to adopt it as a general practice would require a development of buccal tissue, greater, it is to be hoped, than most of us possess. Now, while there is no way in which a wedge can be introduced, in these cases, so as to give positive pleasure to the patient, let us see if there is not a better way than the one described, viz : Take a piece of hickory, or other wood of firm fiber, which will bend without

breaking, cut it to about the proper size, then, holding the end on some smooth surface, bend it by rubbing with a burnisher, until the curve corresponds to the curve of the cervical walls of the cavities, or approaching that. Next, trim till it is found by trial to be of the exact width required. It is then taken in the left hand, passed between the teeth so that the end shall project about one-eighth inch on the palatal side, and with a suitable instrument held in the right hand, it is pressed up against the gum, not forcibly, but with a gentle but gradually increasing pressure until the cervical walls are clear, when a slight push with the left hand, exerted longitudinally, will fix it in its place. It is then cut off, leaving the end projecting the same as upon the palatal side. Sometimes, when we have the V shaped space opening on the palatal side, it is best to introduce the wedge from that side, which can readily be done. If the operation has been performed with due care the patient will not complain of it as a severe one. The gum may be slightly bruised, perhaps, but there will be no lasceration as in pushing the wedge through. In applying the dam both teeth are embraced in one hole, the rubber is tucked under the projecting ends of the wedge and pieces of spunk packed into the angles, which will render the work perfectly secure from moisture if the operation be upon the upper jaw, but for lower teeth it is safer to apply the dam before the wedge in the ordinary way, though a little more difficult to accomplish. The holes should be punched quite near together, so as to have but a narrow strip of rubber between the teeth. After applying the dam, care should be exercised in drying the cavities. As every one knows, a very severe pain is produced by the rapid absorption of all the moisture from a sensitive tooth. The first pledget of paper or spunk introduced gives no pain, the second little or none ; but with the third, the capillary force is exerted upon the moisture contained in the dentinal tubules, tending to produce a vacuum, and thus pulling on the nerve fibrils. The probable reason why spunk gives more pain than paper is, that being softer and of finer texture it is brought in contact with a larger number of the open mouths of the tubules at once. To avoid pain from this source we should stop short of absolute dryness. It is not necessary that every particle of moisture should be removed at this stage of the operation.

With the various so-called obtunders the writer has had but little success. Those which have any effect at all, probably produce it by their caustic action on the nerve tissue at the surface of the exposed dentine, and the pain caused by this action, which must be several times repeated,

added to that still experienced from the excavator, makes an aggregate fully equal to what would be endured if no chemical agent were used. The only way in which I have been able to reduce the sensitiveness of the dentine, has been by the use of temporary fillings, either of ox-chlo, or gutta percha ; something to keep out the irritating secretions for a few weeks.

During the process of excavating, if our patient be a nervous female, she will need all the encouragement which we can give her ; not by the soft, sickening twaddle with which some dentists regale their lady patients, nor by patting the cheek or hanging over her as if she were a sick baby, but by kind, reassuring words ; but above all, by a gentleness of manner and touch, convincing her that we do not willingly inflict pain. At the same time the work should not be done timidly, but with a firm, steady hand. There should be no scratching around in an aimless, uncertain way. We should have a definite object for every stroke, and not make one cut more than is necessary. Our excavators should be sharp and well tempered, with not too much spring in the shaft, which causes a jumping of the instrument, producing a succession of shocks. The hoe excavator gives less pain than the hatchet, because the motion being in a line with the handle, there is less vibration. For removing the decay over a nearly exposed pulp, the spoon-shaped hoe is best adapted, and it is needless to add that it should be held very lightly and the slightest possible pressure made upon it. Much needless pain is inflicted with the engine by holding the burr too long upon the tooth at a time, allowing it to become heated. Every operator knows this, but not every one is careful enough in guarding against it. Many object strongly to having the engine used upon their teeth, and when the work can be done equally well without it, their wishes ought to be respected.

The introduction of the filling is a tedious rather than a painful process, the principal dangers to be guarded against being the slipping of the instrument ; the bruising of the lips by inadvertantly pressing upon them ; the undue stretching of the mouth. The cheek should be gently lifted from the tooth rather than pulled back. The cavities can thus be sufficiently exposed in a majority of cases, especially if we know how to use the mirror. In packing with the mallet, it is not necessary, for the proper condensation of the filling, to strike very heavy blows. While some of our patients will very soon inform us if we are pounding them too hard, there are many timid ones who will sit and suffer and make no sign, except by the contraction of the supercilliary muscle, which is

thus an excellent indication of the amount of force we may give to our blows. So long as the brow remains unruffled, we need not fear that our patient is suffering severely.

When condensing the filling by hand-pressure, if you allow the instrument to rest on the adjoining tooth as a fulcrum, bear in mind that you are using a very powerful lever and regulate the amount of force accordingly; this caution is specially needed if either of the teeth be unsupported. The fillings being packed and condensed, the wedge should be allowed to remain until they are ready for the final polish, which can best be accomplished with the soft rubber disk.

We have thus, in imagination, followed our operation to the end, and in doing so, this essay has been extended beyond the limits anticipated, which will prevent the consideration of other operations in the manner intended, there are, however, one or two points to which I wish to refer before closing.

The tying of a ligature tightly around the neck of a tooth is a painful process and should be avoided whenever possible. When the wedge is used in connection with the dam, ligatures are seldom needed at all, but when they are called for there is no need of tying them so tightly as many are in the habit of doing. The rubber dam clamp, a very useful appliance, may become an instrument of torture if carelessly applied. The operator should never fail to ask the patient if it hurts, and if it does, it should be readjusted or changed for another, the only cases where it need give pain being in pressing it down below the margin of a buccal cavity, or where a tooth is but partially erupted.

Labial cavities, where there is recission of the gum, may be filled with much less pain than they often are, by using a clamp adapted to the purpose, and allowing its inner jaw to overlap the gum, which is protected by a thick piece of spunk. No ligature is required for the dam. There are many other points which might be touched upon, but I will not further trespass upon your time.

If any one among you feels that his practice is not quite what it should be in this respect, a careful study of the subject will readily suggest the remedies.

ÉTUDE SUR LA GREFFE DENTAIRE.

Par Le Docteur Th. David.

(*Continued.*)

Unless there are complications, the adherence is obtained in two or three days, by the immediate reunion of the periosteum, and all is finished. In reimplantation, as applied in treatment of *periostitis* and to bony *lesions*, which are the consequence, matters are not so simple, and therefore, we devote further attention to it, especially as it has not been much practised under such circumstances.

Mr. Magitot, who has kindly authorized us to make known the result of his observations, has practised the operation of Alquie thirty times. The most of these relate to chronic periostitis at the apex of the root, accompanied by *mucous* or *cutaneous fistulæ.* The teeth most frequently operated on in these cases were the small upper *molars*; but all may be operated on, even to the wisdom teeth.

The *lesions* which have most frequently been met with at the summit of the roots, are *denudation* and partial *resorption.*

In most cases the teeth were also decayed and they were filled outside of the mouth. These thirty cases resulted in twenty-seven successes and three failures. The consolidation has been obtained after about ten days. The closing of the *fistulous passages* has generally occurred a few days after the consolidation ; it is only in the cases where there was loss of bone that it has taken several *months.* The existence of a well established fistula has seemed to favor the cure. In the three cases of failure, there was no fistula : the teeth were eliminated by reason of the intra-alveolary suppuration. To make the propositions which we have put forth better understood, we will now refer to the observations taken of some of the operations *in extenso.*

Observation No. 1.

First, large right inferior molar. Penetrating decay. Chronic periostitis at summit of posterior root. Series of gum abscesses. Extraction. Resection of three mm. of the posterior root. Immediate reimplantation. Cure.

Miss L., 18 years old, of a good constitution, suffered greatly from her teeth. One of them, the first right inferior molar began to decay about a year ago. The caries, which occupied the whole extent of the posterior surface, became rapidly penetrating. Caustics were applied to destroy the pulp, and after an appropriate treatment which lasted about two weeks, it could be filled with metallic composition. All troubles disappeared and the dental organ resumed its functions, as if it had never been affected. Everything went on well for six months. At the end of this period there came a sharp attack of periostitis, which showed itself by a slight swelling of the cheek, by elongation, by loosening and an extreme sensitiveness of the tooth. At the end of three or four days, a little abscess opened at the level of the posterior root of the tooth. Immediately the inflammatory phenomena ceased, leaving, however, a dull sensitiveness of the tooth, which from that moment did not operate as before, nor like its neighbor of the other side. Spontaneously indolent, it became the seat of vague trouble or pain, under the influence of changes of temperature, of forced contact, of pressure with the finger, or, during occlusion of the jaws, by the corresponding tooth above.

From that moment a series of attacks of periostitis analogous to the first, were repeated at intervals of about a month, adding thus a sharp, inflammatory state to the chronic pre-existant state. At length there came a final attack, for which Miss L. came to ask the intervention of Mr. Magitot. On making an examination, he found the tooth with its normal color, perfectly filled, but painful under the slightest pressure. The cheek was *tumefied* with redness of skin; the lower maxillary ganglions were sensitive to the touch and painful.

The exterior gum was also red and *tumefied*, and presented a *fistulous* orifice. The Doctor did not hesitate to pronounce it a case of chronic periostitis. And as he knew that lesions of this affection were always limited to the summit, he proposed to the young patient, to reimplant her diseased organ after having extracted it and cut away the afflicted part.

Dec. 10*th*, 1875.—The extraction was quite easily accomplished with the aid of suitable forceps.

Autopsy of the tooth. It presents at the summit of the posterior root, a manifest separation of the periosteum, which is in detached pieces, in an extent of three *mm.* The apex of the root is rough, uneven, eaten away towards the point, which is thus blunted (or weakened). The anterior root is covered with periosteum which is simply congested, granulated, the first indication of *periostical* alteration.

Resection was practised at three *mm.* from the summit of the posterior root by a section perpendicular to its direction, with the aid of strong shears. Then the surface of the section was dulled by means of a file, and the tooth was at once put back in its place. The alveolus had been empty two minutes at most.

Let us say, that before terminating this operation, after the extraction of the first large molar, there was fonnd behind the first pre-molar, which was healthy, the remains of the second pre-molar decayed. It was extracted at once, before the large molar was reimplanted. The latter could not be completely reinstated in its alveolus; in spite of all pressure it remained some millimetres above the level of the neighboring teeth. Chlorate of potass compresses were ordered to be put (permanently?) on the gum, level with the site of the operation. The patient was put upon a liquid diet.

The following night Miss L. had violent chills and was sleepless, though the local pain was not severe.

Dec. 11*th* 1875.—The tooth is still loose and slightly painful to the touch. The general state is still troubled; there is a little pain, the face is red and *congested*, and there are slight *febrile symptoms.*

13*th.*—Yesterday the patient was tired and could not come to us. To-day the local state is good. The cheek is somewhat swollen, there is some tumefaction of the gum, which is covered with white plates of *epithelium* on the way to *disquammation*, but the tooth has sunk lower and almost occupied its normal level. It adheres well—it is not very painful. Mastication is impossible. The patient gives her impressions and says—"The tooth seems now to belong more to me." The general symptoms are quite marked: the night uneasy, appetite gone, the fever continues. We continue the topical applications, and advise tonics.

14*th.*—The general condition is the same—still troubled. The local condition is excellent. The tooth bears the pressure of the tooth above, the under maxillary ganglions are insensible, and the region is quite indolent. On account of the general symptoms, which continue, we advise the parents of the young girl to take her home to Normandie for a few days.

Dec. 20*th*, 1875.—Miss L. comes to see us. Complete cure, health re-established. The tooth shakes *very* slightly under hard pressure. Gum and cheek are normal. No trace of *fistulæ.*

May 24*th*, 1876.—Miss L. has been seen. Everything goes on well.

The organ performs its *functions* properly. There is no pain either spontaneously or under pressure. Gives no more trouble. Perfectly solid.

June 16*th.*—Cure established.

Aug. 7*th.*—Ditto; only the tooth has a gray tinge which enables one to distinguish it from the others.

June, 1877.—Perfect cure.

Observation No. 2.

Chronic periostitis of traumatic origin of the right inferior central incisor. *Cutanious* fistulae of *chin.* Extraction. Reimplantation after resection of the summit of the root. Cure.

Mr. V., 19 years old. Good dentition at 9 years of age. Suspending himself by the teeth from an iron bar he fractured his right inferior central incisor. The internal angle of the extremity of the crown was taken off.

Four years after, abscess at level of the lower edge of the *maxilla* of the fractured tooth, accompanied with pain and loosening of this tooth and its two neighbors. The abscess opens itself on the skin, letting out much matter. The opening remains *fistulous* for a month, then closes, leaving a hard nucleus, surrounded by a slight puffiness. From that time there was formed every year at about the same season, and at the same place, an abscess which was accompanied by the same symptoms on the part of the teeth. Sometimes in the intervals between the abscesses there would be little inflammatory attacks veritable *fluxions* of the chin and gum, with pain and swelling, disappearing rapidly, however. To-day (15 days after the last abscess which has been opened) there is a slight *puffiness* at the chin which is rather hard. The opening has closed, and is surrounded by redness. The fractured tooth is rather loose, but indolent; it is of a gray color, easily distinguished from the rest.

March 4*th*, 1876.—Extraction. Summit of root a little *resorbed*, rough, denuded of its periosteum over an extent of two millimetres. Resection of three mm. Replaced.

March 6*th.*—Inflammatory reaction more intense. Gum red. Tooth not very painful; patient has been able to sleep; mastication is, however, impossible. Chin not so hard. Compresses, soaked in chlorate of potass, on the gum.

March 8*th.*—Chin quite clear (discharged). Soft parts have resumed

their normal size, but one feels on the right side that the lower edge of the maxilla is a little larger than on the other side. The tooth is no longer painful, but it is a little raised.

March 12th.—Patient can eat (with great care). Vertical pressure no longer hurts the tooth, which is still raised. Perhaps a fibrinous clot in the alveolus prevents its going down. With the aim of provoking resorption cauterizations are made, *galvano cautire,* on the gum, along the tooth.

March 15th.—Cauterization with chromic acid.

18th.—Ditto, with red iron.

23d.—The tooth does not descend. One millimetre of the crown is taken off to make it level with the rest. Patient is cured.

Oct. 3d, 1876.—Tooth is solid, performs its *functions* well, and causes no pain. One peculiarity is noticed: it is covered with tartar while its neighbors have scarcely any. The skin of the chin is quite normal. No tumefaction on the maxilla.

Observation No. 3.

Right superior lateral incisor. Chronic periostitis at the summit of root, with fistulous openings in the gums. Extraction of tooth; resection of three mm. from summit of root. Immediate reimplantation. Cure.

Mrs. B., 45 years old, good teeth, caught cold, and had a slight swelling of the gum, situated over the lateral right incisor, which is very painful, though not decayed. This swelling terminates in two abscesses: one situated at the *palatine arch* was opened with a *bistourie*; the other opened spontaneously. No more pain on part of tooth. The tumefaction and palatine opening disappeared rapidly. In the vestibule, on the contrary, the *fistulous orifice persisted* after the cessation of the inflammatory phenomena. Since then, Mrs. B. has not suffered from the tooth, but the *gingival fistula* has discharged a little liquid, which differs every now and then in quantity and *purulence.* After ineffectual treatment of this fistula, Mrs. B. came to consult Mr. Magitot.

Examination.—A probe (stylet) introduced into the fistula arrives at a large bony *furrow,* situated in the thick part of the alveolary edge and near the *plancher* (literally ceiling) of the *palatine arch.* All the anterior teeth seemed sound, with the exception of the lateral right incisor, which is slightly gray. It does not seem to be as solid as the rest; it is a

little sensitive when shaken or pressed. There is no doubt that this tooth has periostitis, which causes the fistula.

June 2nd, 1876.—*Extraction*, summit of root found denuded over an extent of three mm.; rough, pricks the fingers. Where the denudation ceases, the periosteum forms a *fringed flange* (*f*) They cut off with Liston shears all the denuded part and replace the tooth in its alveolus, after having rounded the apex of root with a fine file. As the tooth has a tendency to leave its place, they apply a retaining apparatus, consisting of a *groove* of tin, fixed with collodion to the anterior and posterior surfaces of the two neighboring teeth.

June 3rd.—The apparatus which has stayed well in place is taken off. The tooth is united to the gum and is spontaneously painful. Above it, the gum is red and *tumefied*, the fistula is open, and lets out much matter. They apply compresses, soaked in a very concentrated solution of chlorate of potass.

June 6th.—Tooth adheres a little, gum is less swollen, but there is still sharp pain at the point corresponding to the summit of the root. An injection of water is pushed into the *fistula.*

June 8th.—Condition the same.

June 9th.—Tooth adheres better, but moves a little when shaken. Is no longer spontaneously painful, but sensitive to the touch. A probe introduced into the fistula proves that the *furrow* is still there. Another injection through fistula.

June 13th.—Tooth solid and indolent. Pressure with the tongue or finger upon the *palatine arch*, causes a little stream of *sero-purulent* liquid to come through the *vestibulary* fistula. A probe in the fistula penetrates two or three centimetres, without being pierced by the finger, through the palatine mucous membrane. Injection of water.

June 19 —Suppuration by fistula much diminished. For three days there has been no pressure brought to bear on the *furrow* to empty it, and now they can hardly make a large drop of liquid come out. By exploring with probe, it is ascertained that there are splinters in the way of elimination. To make them come out frequent injections are ordered.

July 2nd.—As this condition seems to continue stationary, we pass a silk thread across the maxilla going from the *ginqival fistula* to an orifice which is made by a needle on the palatine arch. The two ends of the thread are united and hidden under a dental interstice.

July 8th.—The suppuration has been more abundant, probably because of the irritation produced by the thread left.

July 10th.—Suppuration diminished. Silk thread replaced by a platinum thread.

July 26th.—New thread has been well supported. The anterior hole of the fistula still lets out a drop of matter, on account of the pressure upon the *palatine arch.* Injections continued.

Aug. 9th.—Thread removed, because the patient is going off traveling, and frequent injections are recommended.

Oct. 4th, 1876.—Mrs. B. comes to see us. Tooth is solid and indolent, but the anterior orifice of the *fistulous passage* is not closed. It has continued to let out some matter, and to-day we opened it to let out some by pressing the place where was its *palatine orifice*, and closed it after the removing of the thread. The opening is sounded, and the bone found still rough in places.

Then they dilate progressively the anterior orifice of the fistula, then by means of an appropriate instrument they rasp the burrow in such a way as to detach the bony splinters and facilitate elimination. We push in strong injections of water which make them (splinters) come out before our eyes.

Oct. 20th.—The anterior hole of the fistula is closed ; the cure seems now to be assured.

May 1st, 1877.—Mrs. B. comes to see us because it seems to her that the *vestibular* fistula is re-opened. The tooth is perfectly consolidated. We explore the fistula, which is not more than one *mm.* deep. This opening seems to be quite superficial and limited to the mucous membrane—it is hoped that this will be soon cured. It *is* cured after a few days.

June, 1877.—Complete cure.

This observation, purposely chosen, is interesting, not from the consolidation which has been effected in the usual way, but from the bony complications which had to be treated to obtain a cure of the fistula.

Greffe by Human Transplanting.

The transplanting of a tooth from one person to another, is mentioned in the writings of Albucasis. But the first example which any authors have reported comes from Ambroise Pare.

Then we must come to Fanchard to see this operation practised. This author reports one case quite in detail, relating to a tooth which he was obliged to file considerably to make it the same length as the others, and which, in spite of that, consolidated and lasted six years.

After him Bourdet practised this operation several times with success. These authors find imitators in Graebner, 1767; Hunter, 1771; Jourdain, 1778; Richter, 1797; Hirsch, 1801; Bell, 1806; Schmidt, 1807; Woofendale, 1783; and a crowd of other practitioners. There must even have been a great number of operations performed since Bell (who describes them in detail), goes so far as to wish "that they could always have people ready to provide them with teeth, in order that the dentist might always find those of the desired form and size."

We shall say but little of this operation, which presents great difficulties on account of the choice of the tooth to be transplanted.

It may readily be understood how difficult it is to find a root which shall have the same form and dimensions as that for which it is to be substituted. Even if the crown fulfills all the desired conditions to harmonize with the dental arch, it does not follow that the root will fit into the new alveolus.

In order to practise this operation, one would have to follow Bell's example, find many individuals all ready to sacrifice the same tooth. This difficulty is the reason why transplanting is recommended by fewer authors than reimplantation. Among its adversaries are—Laforgne, Andry, Arnemann, Zang, Serre, Richerand, Galette, Augermann, Richard, Londe, Maury, Desirabode.

But in addition to these inconveniences, and the difficulties they present, transplanting brings another more important question. We speak of the possibility of communicating by this mode of greffe, certain infectious maladies, and principally the syphilitic. William Watson, Littsom, Hamilton and Kuhn have reported cases of a similar way of syphilitic contagion, and Rolle in his treatise on venereal diseases, does not doubt this possibility.

It is probably for this reason, as well as for the mutilation inflicted on the individual who is deprived of his tooth, that some authors are much opposed to transplanting, which they consider immoral, and against which they call for the application of the article of the penal code relating to mutilation and cruelty.

Although in principle hostile to this kind of greffe, we, nevertheless, think that it may be tried in certain rare cases, and for particular reasons, but exclusively with teeth with single roots. Then the conditions should be those most favorable to success. On this point, the authors advise in general to take a tooth smaller than the one for which it is to be substituted, a woman's tooth, for instance, to be reim-

planted in a man's mouth : to choose a well constituted person and of adult age (20 to 40).

The indications of the dental transplantation are difficult to establish, for every case only profound irreparable alterations of the crown should make one think of this operation, which should be decided upon by the patient rather than the surgeon.

The manual operations, the consecutive attentions to the replacing, the *keeping reduced* should be the same as for reimplantation. If in the planting of the tooth the root is too long, one can safely cut off a portion.

Let us add, in conclusion, that in order to avoid mutilating one individual in order to restore another, one could (following A. Pare's advice), take the teeth to be transplanted from a corpse which has been dead only a few hours, and in which the vitality of the dental periosteum would not yet be destroyed.

MEETING OF THE FIRST DISTRICT SOCIETY AT HOUSE OF DR. LEE.

(*Continued.*)

FOLLOWING DR. M. F. ODELL.

Dr. C. E. Latimer : I think we are very often mistaken in our criticism of those cases. We may finish a filling as perfectly as we can at the cervical border in proximal cases, and find that there is enamel or cementum exposed between the margins of the gold and gum, food will lodge there just as it did before. The same cause exists which caused caries in the first place, and the same causes will produce the same results in almost every case. The vulnerable point is at the margin of the gold with the cementum or enamel. To just what extent electrical excites to chemical action I am unable to say. If we want to be very thorough in those cases we may carry the gold above the margin of the gum. Dr. Perry was speaking about that only a short time ago, and he said where he had done that by cutting away the cementum and carrying his gold up so as to effectually protect the part exposed, he was successful. We don't like to do that. It makes it more difficult to apply the rubber, and we dislike to cut away undecayed tooth-structure ; but so

sure as we leave that we have a weak place; just as soon as decay begins above an approximal filling we put in an examining instrument, and catch a shoulder of the gold, and we say to ourselves, that operator did not dress that filling down and finish it thoroughly. The operator may have been just as careful and conscientious in doing his work there as any body could be. We should not harshly criticize such an operation. We can not tell the condition it was left in. But so sure as there is space there will be lodgment of food, there will be decay, and the margin of the gold will project. I said at the last meeting, that we might be too thorough in some directions. I used to think every filling must be malleted. I made a great many failings malleting gold, where I could not mallet toward a wall. I mallet now where I can drive toward a wall but never where the force of the blow would drive the gold away from a wall, because I would make leakage on the anterior wall, and have a little black line there. Again, I thought every root I filled ought to be filled with gold; that I thought was conscientious, honest work. I spent a great deal of time and annoyance that I ought to have saved my patients. I remember trying various substitutes for gold in small canals where I could not get gold filling in satisfactory. I tried to make small broaches of platinum, driving them in after winding them with gold foil, and I thought I was doing thorough work. One operator in our city, who stands well in the profession, who is present tonight, found a tooth I had filled with the end of the broach sticking through the end of the root. He extracted the tooth, and very justly condemned, in very severe terms, that operation.

I was too thorough; honest in it as could be, but I did mischief. Now, I don't try to wind gold on platinum broaches and drive them in the roots of teeth. I don't try to mallet gold foil into the roots of teeth, excepting the straightest possible canals. Nearly every root I have filled for the last four or five years I have filled either with oxychloride of zinc or gutta percha. This does not seem quite as thorough as filling with gold, yet I believe I make better fillings, do my patients better service, and I save them a great deal of annoyance and time. I don't fill large cavities as I used to. I only a few days ago looked over my old books, and recalled the largest filling I ever introduced—a superior molar almost from the roots down—and it took a long time. It was a very tedious operation, and if I had built the crown down with amalgam, or made a gold thimble after Dr. Perry's plan and fastened it on, I should have done the patient a great deal better service. I would have saved

him three or four hours' pain and inconvenience, and I should have given him a better operation. I don't try to do those things now. I know I am serving my patients by cutting short this operation. I know I do my patients good service also in using gutta percha. One member took me to task for using that. Nearly all my temporary fillings are made, not of the red gutta percha, but Hill's Stopping, containing hardening material enough to make it wear well. And again, in regard to cheapening the operation, I believe we do harm in demanding such prices as the poor cannot pay. When I have a case that is truly a charitable one—perhaps a shop-girl or clerk in a store, earning only a small salary, who can't afford to have a dozen enormous gold fillings in her mouth—I look over such a case and say, I will give you an engagement at some time that will not interfere with my regular appointments, and I have her come in the evening or between appointments. I work evenings a good deal, because they can better afford the time. I look over the mouth and work as rapidly as possible. I tell them it will hurt a little more, but I must work rapidly in order to cheapen the work. I excavate the cavities, bearing in mind which they are, using the same instruments so far as I can, and I can get them excavated in a very short time, taking out the decay just as thoroughly as I would for the Queen of England, but working and cutting rapidly. I take some of Lawrence's amalgam, because that is finer and will make a good filling where out of sight. I wash it thoroughly with bicarbonate of soda solution, preparing enough to fill all the cavities prepared. They may be very large, but if the pulps are not exposed I can fill those dozen cavities in about the time that would be required to fill one with gold; but I do such patients better service in that manner of working than I could by using gold three or four evenings. I save their teeth and charge them a very low figure, telling them they can pay me $1 a month, if unable to pay more, until all is paid. That is not thorough work, is it? However, I succeed in keeping many patients away from the gas-houses and the botch mechanical workmen, by putting saving-fillings within their financial reach.

Dr. Mills: I am satisfied the most important duty next to good work is to instruct the patients in cleanliness and care of the teeth. A careless patient will undo a great deal of good service. I find the more I can instruct them in the care of their mouths the more permanent my work.

"AN INTERESTING CASE."

By Dr. H. H. Fitch.

On the 15th of August, 1877, Belle Ward, a strong working-girl, about twenty years old, came to my office to have two lower front teeth extracted, because they were sore and loose. She had evidently been salivated, and the teeth in question were denuded to very near the apices.

I persuaded her to have them treated, and also to have a crown fissure cavity filled in the second left lower molar. This cavity was not deep. The only apparent disturbance was the inflammation of the gums consequent to the use of mercury.

The patient complained of great tenderness of the teeth themselves "when she bit anything onto them," and when she "took anything hot or cold into her mouth."

I judged that this great sensitiveness could be accounted for from the fact that she was just recovering from malarial fever—having observed nearly the same symptoms in persons just recovering from typhoid.

The teeth were carefully cleansed, and the gums painted with iodine. This application was renewed every day. In less than a week the teeth were firm and the gums of normal appearance. Still the teeth were sensitive, and, August 29th, fourteen days from the first sitting, the patient came again, saying that the filled tooth was killing her. The swollen condition of the surrounding parts indicated abviolar abscess. Immediate extraction was decided upon, after which I at once split the tooth, and found a little nodule of bone in the very center of the pulp. This ossification, or dentricification, or calcification was also found in the root canals. Twenty-six days later, I gave the patient ether, and removed three more teeth, and, four days later, still one more—all in substantially the same condition.

The development of the nodules was from the central portions of the pulp. The most marked symptom was the exceeding sensitiveness of the teeth in question to the slightest thermal changes or the slightest pressure. Have just received word from the patient that the other teeth are troubling in the same way, and that she will have to lose them all before she can have any comfort.

I have found cases recorded where one, or, at most, two teeth were affected in this manner, but not a case where the trouble was so general.

Harris gives ossification of the nerve pulp as the result of irritation. This would explain that ossification which follows the recession of the pulp consequent to the wearing away of the tooth by mastication, but hardly a case like the one under consideration.

I sent two of the teeth to Dr. Homer Judd of St. Louis, and his remarks will be found in the November number of the *Missouri Dental Journal*, page 562.

I would say, in conclusion, that my patient fully indorses Beecher's present compensation theory of Hell.

THE EFFECT OF DISEASED TEETH AND OF THEIR LOSS UPON THE GENERAL HEALTH.

By H. M. Grant, M. D., D. D. S.

Various opinions have been advanced in regard to the manner that diseased teeth and the loss of them affect the general health. We are well aware that the human system is a delicately formed machine, the functional activity of each part being dependent upon another and sympathizing with the whole. Thus we see

> "From nature's chain, whatever link we strike,
> Tenth, or ten thousandth, breaks the chain alike."

Whenever there is a morbid tendency to functional derangement, however slight it may be, if not corrected at once, it will insidiously work out its deleterious effects in the end. Some organs may be affected from very trifling causes, while others, exposed in the same manner, are seemingly unaffected; but at the same time, the remaining organs are taxed, indirectly, in proportion to the number of links broken in the chain of our being. What, then, must be the effect of a mouth full of decayed and diseased teeth, containing viscid, offensive matter? Even the act of inhalation in such a case carries some of the products of purulent decomposition into the pulmonary air cells, where these purulent products act upon the tender, delicate structures of the lungs. They are also absorbed by the blood, and when they thus enter the circulation, these products of diseased teeth may affect the whole system, producing troubles of a grave character, such as neuralgia, dyspepsia, sick headache, earache,

inflammation of the eyes, &c. These affections derange the whole system, and frequently require the services of a physician, or else terminate in a broken-down constitution. When the physician is consulted for these chronic nervous affections, he often has to refer the patient to the dentist.

Many cases of that dreadful disease which we call neuralgia facia, which have resisted all other treatment, have been cured by treating the teeth, or by their removal. The sensory nerves belonging to the eyes, ear, nose, mouth, teeth, and distributed over the cheek, are branches of the great nerve of sensation, the fifth pair. Hence, whatever part of this chain is irritated, the pain may be experienced in any other part. In addition, the patient generally has a weak stomach, bad digestion, and offensive breath, which result in bad health and low spirits—all for want of good and healthy teeth to masticate food, which is a preparatory process, indispensible to a quick and easy digestion. The loss of these organs in brutes is soon followed by death; but in man they can be restored.

Many writers contend that more than one-half of the diseases that afflict mankind arise from a disordered state of the stomach. And why this disordered state of this organ? Dr. Thomas E. Bond has thus poetically explained it:—

"'Tis nature's general plan,
That all the solid aliments of man
Before admission to the secret shrine,
Where vital chemistry, with skill divine,
Transforms the cruder mass to milky chyme,
By nature's metamorphosis sublime—
Should suffer communition; hence we find
The dental organs formed to cut and grind,
And masticate the food; this rightly done—
The process of digestion well begun—
Results in health to each dependent part
That feels the living impulses of the heart;
But when, from loss of teeth, the food must pass,
A crude and rigid and unbroken mass,
To the digestive organs, who can know
What various forms of complicated woe
May rise terrific from that single source!"

Having thus referred to the various evils and disadvantages of diseased and lost teeth to the human system, I wish to impress upon you the vast importance of preserving your teeth and your offspring from decay. Being connected with all the great functions of life, and rendered by nature

durable in substance, combining strength with symmetry, and intended to survive every other part, why are these useful organs found decaying before middle age, and even in childhood? We answer, that it is principally due to our unnatural mode of living, the kind of food we eat, and the manner in which it is prepared.

The effect of disease of the teeth upon the general health often commences in early childhood, when these pearly gems have not yet been erupted. In truth, there are but few organs whose diseases maintain such constant relations to any period of life as diseases of the mouth, dependent upon the eruption of the teeth, do to that of childhood. It might be almost asserted as an impossibility, that infants could pass through the period ending with dentition, without suffering from some disease of the mouth and other disturbances consequent thereon.

The physiological cause of this association of infancy and disease may be found in the fact of the great activity with which the vital processes are carried on at that period, and their consequent liability to derangement. Secretion is then active; the membranes are exceedingly vascular, and the mucus is copiously secreted upon the mucus membranes of the digestive organs. Any course that alters the quantity, or impairs the quality, of the secretions, or that disturbs vascular action, will be promptly felt by the general system, and produce changes in organs more or less remote from the primary source of disease; and hence we have all of the long train of diseases peculiar to and following dentition. These effects, if not properly treated, may last to puberty or continue in after life.

Again, the nervous disturbances dependent upon a diseased condition of the teeth, or even a single tooth, are frequently so distant from the primary cause as to present serious obstacles to a correct diagnosis. Some of the diseases arising during pregnancy are often traceable to the oral cavity, and the organs therein contained, as the primary source of trouble.

When the question is asked, how it is that an organ sympathizes with some one in preference to another, we reply, that it is either owing to its contiguity, or is concerned in the performance of the same functions, and hence indicating the closest fellowship and most intimate relation. But in the case of the teeth and uterus, there is no such relation, either by contiguity, by direct intercourse through nerves, or by any special connection in the performance of function. Yet it is manifest there must be a relationship, through some channel or other, to explain the pres-

ence of the sympathetic symptoms. The question still is, What is the channel of intercourse? A man has locked jaw from injury to the toe—a sympathy even more remote and quite as obscure as that of the teeth and the uterus. Our own opinion is, that the medium of connection is the same in both cases, and that the sentient track of the spinal marrow is this medium. In the one case, the sentient nerves of the uterus, being impressed by the changes occurring in this organ during the periods of menstruation and pregnancy, reflect this impression to the sentient track of the spinal marrow, whence it is conducted upwards, along this track, to the point where the fifth pair of nerves pass off, and here it takes the route of this nerve—the great sentient nerve of the teeth and face—going along the dental branches where there is pain in the teeth;* while, in the case of trismus, the impressions are conveyed by reflex action to the muscles of the lower jaw, where the impression from the sentient nerves of the toe are also reflected to the spinal marrow.

Dr. W. Tyler Smith, of London, says: "Irritation of the tri-facial nerve has been known to excite abortion. It happens when no cause can be recognized but the appearance of the dentes sapientiæ; and this

* It seems to us that this explanation is too exclusive, and unless other known facts are brought out in reference to changes occurring in pregnancy and lactation, the line of treatment suggested for some of the troubles incident to these conditions will prove inefficient. Decay of the teeth during pregnancy and lactation are too frequent in practice to require reports of cases to establish the fact. Analysis of the blood in such cases show that the phosphrous principles are in excess in this fluid, while they are diminished or altogether wanting in the urine. The legitimate inference from these and other familiar facts is that the excess of the phosphorous elements in the blood goes mainly to the fœtus, in the one instance, or enters into the formation of milk in the other; in either event, the mother suffers for the want of phosphates *for her own system.* In other words, the excess of the phosphates found in the blood of the pregnant or nursing woman is not intended for her at all—it is for the fœtus or the infant. The amount of phosphates essential to a healthy adult is thus diminished, and the mother's system bears the effect of this loss. These phosphates enter largely into the structure of the bones and of the teeth. There is, then, a direct loss of the bone-forming substance in the system during pregnancy and lactation. Reflex sympathy, as explained by Dr. Grant, may cause the effect to be felt more by the teeth than other structures, but the irritability itself is most probably due, in the majority of cases, to the loss of these phosphates. Our attention has often been directed to this subject; and Prof. J. S. Wellford, of this city, has for some time been making observations which he proposes to publish. This irritability of the trifacial nerve, and the decay of the teeth due to pregnancy, can in most cases be prevented by a systematic treatment by the phosphates. Dr. Wellford is in the habit of prescribing:

℞. Tinct. ferri chloridi
Acid phosphoric, dilut. $\overline{aa}$ .... ℥ j
Quiniæ sulphatis ..... gr. xlviij
Liquor arsenitis chlor. ..... ℥ iss
Strychniæ ..... gr. j
Aquæ puræ q. s. ..... ℥ vs
M. Make a mixture. S: Teaspoonful three times daily.

phase in dentition is known to produce considerable local and constitutional disturbance. General convulsions may, in fact, be excited from this source, either in the male or female subject. The reflection of irritation from the tri-facial upon the uterine nerves, in the young pregnant woman, is no more remarkable than the stranguary excited by teething in the infant."

In June, 1876, I was called in consultation in the case of a lady who, six days after labor, was attacked with a severe pain in the uterus. It was of an intermittent character, and during the intermission she had very severe and agonizing pain in the face. Leeches, fomentation, &c., were applied to the abdomen, and calomel and opium were given internally. But the pain in the face became more severe; in the language of the patient, it became unbearable, when I was sent for. I found her face covered with flannel, which led me to suspect that some one of her teeth was the exciting cause of the trouble. Upon examination of the mouth, I found the posterior part of the gum of the left interior maxillary red and much swollen. The mystery was explained. The dentes sapientiæ —the cause of all the pain—were coming up. The gum was freely lanced, and the pain in the uterus from that moment subsided. No more medicine was required or given.

In September of this year, 1877, I was called in consultation by a physician of a neighboring town to see the following case :

Master W. B. S., from an adjoining county, aged 15 years, was attacked about three weeks before the time I saw him with odontalgia, caused by the first upper molar tooth on the right side, which was very much decayed. He retired to his bed at night with very severe pain in the tooth and face on that side. When he awoke the following morning, he could not see with his right eye, and but little with his left; blindness continued up to the time I saw him. Upon examination, I found the tooth before mentioned very much decayed and painful to the slightest touch. I advised its extraction, which was done. The same evening the patient could see some out of his right eye, and the dimness of vision of the left was perfectly removed; and only a few days elapsed, as I have since been informed by the attending physician, until his sight was perfectly restored.

The importance of a thorough knowledge of the various evils resulting from the condition of the teeth, is strikingly illustrated by a case to be found in Harris' *Principles and Practice of Dental Surgery.* The subject, D. M., after years of suffering consequent upon efforts at the eruption

of a wisdom tooth, sought relief by a change of climate, in addition to the best medical advice. Both, however, proved unavailing; the irritation extended to the lungs, and established a confirmed phthisis pulmonalis, from which he was only relieved by death.

From the various testimonies which we have endeavored to adduce and sustain by physiological reasoning, we must conclude that this subject is one worthy the investigation of the intelligent physician, it being the primary source of very many of the ills to which frail humanity is heir. And if this hasty and imperfectly gotten up paper can be the means of directing the minds of the Fellows present to this subject, my object will be gained, and my duty as an essayist discharged.

Virginia Medical Monthly.

DENTAL OPERATIONS IN RELATION TO ANÆSTHETICS.

Clinical Lectures delivered at the Dental Hospital of London.

By Alfred Coleman, Esq., F.R.C.S., L.D.S., &c.

In describing the symptoms or appearances indicative of danger, we must bear in mind that fatal cases have been so rare that happily no one can speak from large experience. The ordinary appearance of a patient inhaling nitrous oxide is, in most cases, decidedly alarming. I well remember the impression it first made upon myself, and indeed upon others habituated to the employment of anæsthetics; we have become accustomed to such appearances, but we may, if too careless to them, overlook real indications of danger which they may to some extent mask. In some cases, not only is the asphyxiated appearance very strongly marked, but it is attended with convulsive movements suggestive of epileptic attacks, and for the reason, no doubt, that we have certain of the conditions present which exist in an epileptic seizure; provided the patient breathe freely, we have only in such cases to supply fresh air, gently slap the face with a wet cloth and protect the patient from self-injury. I do not think epileptic subjects are more liable to these attacks than others. I have never witnessed a fit so produced, but have often seen it follow the removal of a tooth without an anæsthetic; venous blood injected into the vessels of a limb recently amputated causes muscular contractions, hence doubtless the cause for such movements under nitrous oxide, epilepsy, etc. The symptom which should most impress

itself upon us is a cessation of respiration during the administration of nitrous oxide, and still more if the inhalation has been completed. True! in the majority of cases there is more or less a tendency on the part of the patient to avoid a free or tranquil respiration, and this is much more conspicuous where ether is combined with the gas. Sometimes the breathing is shallow, rapid and puffing; very common in nervous females and occurring soon after the inhalation is commenced; in such cases the air in the lungs is but slowly exchanged, the patient is longer in becoming unconscious and more exhausted afterwards. It is here a firm request to breathe more slowly will generally be of avail. A little later in the administration we often find the patient forcibly resisting respiration, in which case the breath may be held five or six seconds without cause for alarm; but if for longer the facepiece should be withdrawn, and if without effect the thorax firmly pressed upon, and after a respiration or two of pure air the process may be continued.

The truly dangerous condition is when the respiration has ceased, the lungs are nearly empty, the face perfectly immovable as in death, or as it may be strikingly witnessed when a patient is breathing through a tracheotomy tube, the countenance livid and the eyeballs congested and turned upwards, and the temperature of the body colder than normal. I have witnessed these conditions two or three times, and truly alarming they were. I did what I counsel you to do in such cases without losing a moment of time. I at once pulled forward the tongue and pressed firmly on the thorax with both hands; the feeling I remember in one, and that the worst case, was that the chest appeared immovable, and I was in the act of removing the patient from the chair to the ground, where I could more readily apply artificial respiration, when, to my unspeakable relief, a feeble voice exclaimed, "Is it quite out?" I had, therefore, no necessity for resorting to regular artificial respiration, which I should have carried out by laying the patient face downwards, then raising the arms well above the head, and then bringing the elbows down upon the sides and forcibly compressing the chest with them, occupying about three seconds in the process. In the above case the patient was, I afterwards learned, in a condition of extreme debility, had passed three sleepless nights, and had taken little or no food for the same period. In such a case a little stimulant, probably, should have been previously administered. The experiments made by the committee appointed to investigate the merits of nitrous oxide showed, in the case of healthy animals, that death took place in the following order of symptoms : after

continuing the inhalation for about one to two minutes after complete unconsciousness was attained, the respirations became slower and slower, there being a greater interval between each, decreasing as it were in frequency in a geometrical progression until we speculated upon when they had entirely ceased, often being surprised at one or more occurring when we had concluded they had ended; during this time the pulse gradually became weaker, but this was not so much noticed until the respirations had become quite slow; invariably the heart's action could be felt for some time, probably 30 seconds or longer after respiration had terminated.

We invariably found, however, that if we ceased the administration before the respiration had ended the animal recovered without assistance; when the respirations had ceased, but the heart's action had not, artificial respiration invariably resuscitated the animal, but not otherwise, whilst after cessation of the heart's action by no means could animation be restored. It must be remembered that the animals were, or most probably were, healthy ones, otherwise such experiments would teach us without hesitation that so long as our patient is breathing he is safe, and so long as the heart continues its action, artificial respiration may, we should feel almost confident, resuscitate him ; unfortunately our dangers will probably not occur with the healthy but with the unhealthy, and if we have to deal with one suffering from a weak and fatty heart, how can we expect the action of such an organ to continue any time after respiration has ended? Whilst we must not neglect the pulse there can still be no doubt but that the respiration should occupy our chief attention, and this failing we rush immediately to our sheet-anchor, artificial respiration ; other remedies if at hand—galvanism applied at phrenic nerve and diaphragm, ammonia to nostrils, slapping chest with wet towels—may be employed, but these must be used only as auxiliaries to, not replacing, the efforts of the one who is engaged in the aërating process. In regard to the pulse, I think it very liable to mislead in nitrous oxide ; I have often felt and heard bystanders observe that it has become scarcely perceptible, whilst yet the heart's impulse had apparently shown no loss of power. I am inclined to account for this by the increased rigidity of supinator longus and flexor carpi radialis muscles raising the finger from off the radial artery.

The question which may next occupy our attention is, whether there are any known conditions of the system in which nitrous oxide is contra-indicated.

Pregnancy, our experience informs us, is no barrier to its employment; it appears in no way prejudicial to either mother or fœtus.

Phthisical patients take nitrous fairly well, getting anæsthetised with less gas—a fact we should have anticipated—than ordinary patients; anæmic patients do the same.

Patients who have suffered from acute rheumatism resulting in damaged valves of the heart, &c., appear to take nitrous as well as ordinary patients; but the appearance of a lady, who I afterwards learned was affected with cyanosis, was such I would rather not administer it to again under such conditions. Those with weak and fatty hearts must always be unsafe subjects for the gas or other anæsthetic, though probably it has been given to many thousands of such unknowingly; independently of any action of the agent the excitement of taking it may alone suffice to arrest its movements. Should we have a knowledge or suspicion that our patient is so affected, besides redoubling our precautions in regard to careful observation of symptoms, and here especially in regard to the pulse, we shall do well to combine with our gas a little ether as anæsthesia approaches. We had such a patient about a fortnight ago, and in addition to that precaution some of you might have noticed that I almost peremptorily arrested the gentleman who was operating the moment I observed the slightest evidence of returning consciousness, and for this reason, any considerable shock to such a patient might have readily arrested the heart's action. In the Exeter case an upper molar tooth had, by means of a powerful instrument forced into its pulp cavity, been split into fragments; I do not say this was the cause of death, but we may well bear in mind the views of Dr. Brunton in regard to shock occurring under chloroform operation—views which appear to me of greater weight the more I think of them, and compare them with fact.

But to return. Of all conditions in which we may think the gas will prove hurtful, there are none in my opinion so likely to incur danger as persons affected with atheromatous disease of the cerebral vessels, and upon which any little additional strain, such as probably occurs in nitrous oxide administration, would be dangerous, and I think as a rule we shall do well to refuse it in such cases.

Independently of danger, nitrous oxide may be attended with very disagreeable after conditions; of these we may have vomiting, and vomiting combined with syncope, and this I have noticed to be much more common in hot weather, such as we have recently experienced, than at other times. In one or two cases a little brandy administered

previously has apparently prevented these unpleasant results in some who had on former occasions so suffered. A deep, sleepy condition, such as if the patient had taken a powerful narcotic, is occasionally manifested ; my impression is, it is best to let the patient sleep it off under guarded observation. Headache, often severe and lasting more than the day of the administration, is not uncommon. I do not know that you can suggest a better remedy than rest, quiet, and patience. Strange sensations or absence of ordinary sensations are sometimes complained of for days succeeding an administration, the result, no doubt, of certain changes the nervous centres have suffered from the abnormal condition of the blood during the inhalation. One patient has told me that after taking nitrous oxide sugar has on each occasion appeared in his urine—an interesting fact if it be at all general, and pointing of course to cerebral change. Before I quit the subject of nitrous oxide I may warn you, if you value your velvet-covered chairs, to avoid your patients inhaling it with bladders at all requiring emptying, as this may, especially should your patient be a pregnant female, result in a catastrophe distressing to your patient and detrimental to your chair.

Ether, although, no doubt, much safer as an anæsthetic than chloroform, is yet, probably, less safe than nitrous oxide ; owing to its pungency and irritating nature, it is less agreeable to take than either. Dr. Fay, of Brussels, has, however, informed me that he obtains ether from Paris free from those drawbacks. It would be desirable to have such a statement confirmed, especially if the article be perfectly pure, there being ground for concluding that small impurities, such as may be contained in the ether used for congealation, render it unsafe. As before noticed, the objections to ether may be quite overcome by employing it as Mr. Clover first did, in combination with nitrous oxide. It requires some little practice and dexterity to administer it with his admirable apparatus ; the simpler but less perfect ones such as you see me employ, also that devised by your comrade, Mr. Pedler, entail little, if any, more experience than with nitrous oxide alone. The great point to observe is to turn on the ether at the right period ; if too soon, there will be struggling, suspension of respiration, &c. ; if too late, there will be no benefit from the ether in prolonging the anæsthesia. In this matter, experience alone can be the guide.

Ether, with nitrous oxide, is most suitable for cases in which several teeth are to be removed at the one operation ; I think, also, especially calculated for cases in which an operation is likely to be followed with

severe after pain, as in a tooth giving rise to alveolar abscess, or in the early stage of the same, recovery is not so sudden as with nitrous oxide alone.

In regard to symptoms indicating danger, these will be much the same as in nitrous oxide alone, only, perhaps, less apparent, and consequently requiring greater watchfulness, as with the other there is usually less lividity than with the gas. Whilst carefully watching the respiration, the pulse may be more regarded than in the case of nitrous oxide.

In employing the ether combination we must look for more tendency to vomiting than with nitrous oxide alone. It is a most unpleasant drawback to the use of anæsthetics, and therefore it is one of the greatest merits of nitrous oxide that it is the most free from this casualty. In regard to ether, *vice* chloroform, the latter has been reckoned by Mr. Jonathan Hutchinson as the safer for elderly people, there being less violent struggling, and consequently less exhaustion ; but this must appertain to ether administered alone, as with the nitrous oxide combination there is probably less struggling, when carefully administered, than in any other method.

The administration of chloroform in dental operations has now become so exceptional a matter that we need devote but a short time to its consideration ; still, there are certain exceptional cases in which it is preferable to other anæsthetics. Thus, we find, in rare cases, a patient who recovers so rapidly from the ether combination that perhaps it may be only possible to remove but one tooth or root at an administration. Such a patient we had before us recently, and as she required at least from twenty-five to thirty roots, all very firm, to be removed, I advised the administration of chloroform as likely to prove best for her case.

In cases where great muscular contraction has to be overcome, as in the case of impacted wisdom teeth, chloroform may be regarded as preferable, although my colleague, Mr. Mills, of St. Bartholomew's, informs me that in the reduction of dislocations he has found ether almost, if not quite, as efficacious. In those cases bordering on the limits between Dental and general surgery, such as the removal of epulis and kindred tumors, the dissecting out of cicatrices, and when the operation must occupy some time in its performance, and the anæsthesia be kept up during the period, chloroform will no doubt be preferred.

As to the mode of administration, I doubt whether there is any one vastly superior to another ; the Scotch school have, as a rule, performed it in the simplest manner and without apparatus, and with, I believe, a

success as great, if not greater, than in England, where apparatus has been more generally employed. The conclusion I have come to is, that safety depends upon the experience and judgment of the administrator rather than upon the manner of administration, and in obtaining such assistance I would advise you to consider the former, leaving the latter to his discretion ; in case of accident, your responsibility will be lessened. I need here hardly express the opinion that if it be an unwarrantable assumption of responsibility to administer, single handed, nitrous oxide for Dental operation, it is absolutely criminal to do so with chloroform. Practitioners are often so pressed by patients, with such assurances as "I take it so well," "My maid often gives it to me," etc., and a wise practitioner some little time since, by so refusing, saved himself from an awful responsibility, the patient so requesting dying under the hands of an experienced anæsthetist.

NEW TREATMENT OF PLASTER CASTS.

In response to the offer of a prize by the Prussian government for a method of so treating plaster casts as that they may be washed, and at the same time that the pores of the material shall be so closed as to prevent the entrance of dirt, Dr. Ressig gives two different processes whereby the plaster is transformed into a combination, insoluble not only in water, but in soap suds.

The first method is based on the fact that sulphate of lime is changed by baryta water into sulphate of baryta, a caustic lime gradually transformed by the action of the atmosphere into a carbonate of lime, as we know from the similar action of plaster and mortar. Baryta water is prepared by slacking together in a securely corked bottle one part of crystallized hydrate of baryta with about twenty parts of rain water, thus forming a saturated solution. After it has cleared, it is sponged or poured over the plaster as long as the cast will absorb it. The cast is then dried moderately and more baryta water applied, if it still takes it in. This treatment, besides hardening the cast, gives it a beautifully white and clear appearance.

The other method is by using a silicate of potash. To obtain this, water containing about ten per cent. of caustic potash is heated to 212° F., and to this is added as much silicic acid as the potash solution will dissolve. Some clay and silicate of potash are precipitated on its cooling. Preserve this liquid in tightly stopped bottles until no signs of turbidity are seen. When about to use it, throw in a small piece of potash—one

or two per cent. The solution is applied by dipping the cast, or by applying the liquid with a sponge or spray. An almost instantaneous change occurs, when the superfluous solution should be carefully washed off with soap suds. Some practice is necessary to determine the time of exposure by this last method.

Casts thus treated are no longer, so far as their surfaces are concerned, plaster, and are very hard and durable. They are still however porous, and absorb dirt. To close the pores, dissolve one part of castile soap in ten parts of alcohol, and wash the cast with this, which will close the pores. A better way, though more expensive, is to dissolve steatite of sodium in pure spirits of wine, and warm the cast before applying This gives an almost vitreous appearance to the cast, and produces an exceedingly beautiful appearance.—*American Journal of Dental Science.*

FRACTURED TEETH.

Dr. C. W. Spalding:—Patient, a lady forty-five years of age. General health good. Teeth large and strong, of good texture, aud well cared for. Called for an examination of a tooth in which she supposed there was a large cavity of decay, as food seemed to collect in it and cause pain. On examination I found the tooth (the right superior bicuspid, with prominent cusps and correspondingly deep fissure), perfectly sound, but with a fracture extending entirely across the crown, from the mesial to the distal surfaces separating the cusps. The fissure was filled with particles of food, which I removed. As my patient would not submit to the extraction of the tooth or any other treatment, I discharged the case, since which time I have not heard from it. I should mention that there was a little mal-articulation of the teeth, the outer cusp of the superior tooth antagonizing with the inner cusp of the lower. There was therefore, no splitting force exerted by the mode of articulation. The cause of the fracture is, to me, a mystery.

Dr. Judd—I have seen several cases of fractured teeth, the cause of which was somewhat obscure. A lady forty years of age; structure of teeth good; articulation perfect; had the first superior bicuspid fractured, splitting off the lingual cusp, the fracture passing under the gum. The tooth was sound and no cause could be assigned for the accident. I destroyed and removed the nerve, filled the root canals and pulp cavity, rounding up the filling and leaving the tooth in shape like the cuspid. Second case: A lady of thirty; first superior molar, small cavity on mesial surface; fracture extending through the crown leaving the palatine

fang attached to the lingual half and the labial fangs to the opposite part. Removed the tooth, found abscess at the apex of each fang. The patient was totally unconscious of the existence of the fracture, and had no recollection of any accident which had happened to the tooth.

Dr. Fuller:—A lady sixty years of age; good health, and strong, well developed teeth; found upon examination the second superior bicuspid split into two equal parts separating the cusps, and as it proved, the two fangs of the root. Destroyed and removed pulp; treated and filled root canals; passed a bolt through crown, bringing the parts together, then filled. The results thus far very satisfactory. The tooth was alive, perfectly sound, occlusion perfect, and the patient had no knowledge when the accident occurred, or how.—*Extract from proceedings of the St. Louis Dental Society, in Missouri Dental Journal.*

OBITUARY NOTICES.

Prof. George T. Barker.

After the adjournment of the regular meeting of the Odontological Society, on the evening of January 15th, 1878, in addition to previous action of said Society, on motion of Dr. Ambler, Dr. Lord was made Chairman of a meeting, including the members of the Odontological Society present and their visitors, to pass resolutions relative to the death of Dr. Barker of Philadelphia.

Drs. Francis, Dwinelle, Perry, Ambler, and Bronson were appointed such committee, and, on motion of Dr. Jarvie, the committee was instructed to publish the resolutions and the minutes of the meeting in the Dental journals, and that a copy be sent to the family of the deceased and the Faculty of the Pennsylvania College of Dental Surgery.

On motion, the meeting adjourned.

E. A. Bogue, Secretary.

The Committee, therefore, in accordance with the above instructions, respectfully present the following :

Whereas, Learning, with deep regret and sorrow, the death of our friend and professional brother, Prof. George T. Barker, of Philadelphia, in the prime of his manhood, and of his usefulness to the dental profession and humanity ; therefore,

Resolved, That we appreciate the upright, conscientious, and earnest

services of Prof. Barker, and remember, with feelings of gratitude and admiration, his eminent ability, his untiring research, and his candid and generous action in all matters pertaining to the world of professional thought and investigation.

Resolved, That our regret for his untimely decease is lightened by the remembrance that his services to dentistry will insure that his name and memory will always occupy an honorable and distinguished place among those of our profession whom we all delight to honor.

Resolved, That our sympathies, true and heartfelt, are hereby tendered to the family, relatives, and friends of the deceased in this sad and inscrutable dispensation of Divine Providence.

Resolved, That we tender to the Faculty of the Pennsylvania College of Dental Surgery an expression of the deep sense of the loss they have sustained in the death of him who has been so long associated with their institution and its interests.

Chas. E. Francis,
Wm. H. Dwinelle,
T. G. Perry,
J. G. Ambler,
Wm. A. Bronson,
} *Committee.*

Dr. Wm. B. Dennis.

The committee appointed by the American Academy of Dental Science, at a meeting held at the house of Dr. Preston, Mt. Vernon St., Boston, November 7th, 1877, to present resolutions of respect to the memory of Dr. Wm. B. Dennis, deceased, late member of the Academy, respectfully beg leave to report the following :

Resolved, That in the death of Dr. Dennis this Academy has lost a valued member, whom his associate fellows have respected as a faithful worker in our profession, and whose integrity and honesty of purpose have been manifest to all that knew him.

Resolved, That while we extend to his family our expressions of sympathy in their deep affliction, we most sadly feel how inadequately we can express the sense of bereavement, to those who have lost a devoted husband, a loving father, and a dutiful son.

Resolved, That the Secretary be directed to send a copy of these resolutions to the family of the deceased, and to cause them to be published in the Dental Journals.

Frederick N. Seabury,
Henry F. Bishop,
Geo. T. Moffatt.

Dr. Prescott E. White.

Dr. Prescott E. White died in Brooklyn, N. Y., Feb. 2d, 1878, aged 32 years.

At a meeting of the Brooklyn Dental Society, held Feb. 11th, 1878, the following resolutions were unanimously adopted :

Whereas, It has pleased Almighty God in His divine wisdom to remove from our midst, in the prime of life and in the height of usefulness, our esteemed professional brother, Dr. Prescott E. White, therefore,

Resolved, That although Dr. White had been with us but a comparatively short time, he had endeared himself to us, and we had come to regard him as a talented and progressive member of our profession.

Resolved, That we tender to his family our sincere condolence in this hour of their affliction, and that a copy of these resolutions be presented to them, and furnished for publication.

O. E. Hill, President.

C. P. Crandell, Rec. Sec'y, B. D. Society.

NOTES.

Guarana in Sick Headache.

BY C. H. HARRIS, M. D.

I wish to call attention to the value of guarana (paulinia sorbilis) as a remedy for that very distressing complaint, sick headache. I have been a sufferer from this affection for years, and of the various remedies that I have tried, time and again, for my own relief, and for the relief of others, have found them worthless when compared with guarana. Whenever I feel an attack coming on, as those who are subject to this headache can readily tell, all of its symptoms are at once dissipated by a teaspoonful of the fluid of the extract of guarana; and when I have been suffering severely, a teaspoonful, repeated in one hour, will generally afford prompt relief.

It has also been recommended in other diseases, viz.: irritations of the gastric and intestinal mucous membranes, and in irritations of the urinary passages; but I have never used it in any of these affections.

I make use of the fluid extract prepared by Parke, Davis & Co., Detroit, Michigan. —*From Va. Med. Monthly.*

Fluoride of Calcium in Teeth.

"Fluoride of calcium is so integral a part of the enamel of the teeth, that we are inclined to ascribe to its presence (at least in part) the polish and extraordinary hardness of that substance." Berzelius (Alt. Gehlen's Jour., Bd. 3, S. 1,) found 2.1 % of fluoride of calcium in the dentine, and 3.2 % in the enamel of man's tooth, while the dentine and enamel of an ox contained respectively 5.69 % and 4 % of this constituent. The presence of fluoride of calcium, in small quantities, has been deter-

mined with certainty in the bones of almost all animals. Both Middleton and von Bibra have recognized the presence of fluoride of calcium in the bones of mammals, birds, reptiles and fishes, and even in the shells of mollusks. (Lehmann's Physiological Chemistry, vol. I, p. 383, 1855; also Quain's Anatomy, 7th edition, p. 789.) *Contrib.*

Henry Daniel Ruhmkorff

recently died in Paris, aged 74. He was born in Hanover, and in 1844 brought out his first invention, a thermo-electric battery. In 1861 he produced the splendid instrument with which his name is connected, called the Ruhmkorff Coil. It acquired European fame, and was, we believe, the chief attraction at a conversazione given by Mr. Peter Squire. For this invention he was rewarded by a medal and decoration at the Exposition of 1855, and in 1858 he received the prize of 50,000 francs (2,000*l.*) at the French Exhibition of Electrical Apparatus.

Troy and Avoirdupois Weight.

A lengthy discussion has recently been published in the *Pharm. Jour. and Trans.* in regard to the signification of characters in common use. It has, however, been practically settled by the statement of Professor Redwood, who has explained that the sign ℔ should always represent the Troy pound; that lb. represents the avoirdupois pound. ℥ stands for the Troy ounce (480 grains), and oz. for the avoirdupois ounce (437½ grains).

Sodium Bicarbonate as a Remedy for Burns.

An English chemist laughs at the idea of bicarbonate of sodium being a new treatment for burns. He says that in England, twelve years ago, it was known to all working chemists. When in the laboratory, if he was burned by any mixture, he would run to the soda-drawer, grasp a handful, and plunge his hands into water, getting instantaneous relief.

Production of Oxygen by a New Method.

According to a Belgian photographic journal, Herr Zinno has discovered a new way of preparing oxygen in large quantities. Baric peroxide and potassic permanganate are placed in water and allowed to act upon one another, the result being that 200 cubic centimetres of oxygen are evolved from every gramme of the mixed substances.

Alumni Meetings.

We have received the following notice:

The twenty-third annual session of the Michigan Dental Association, will be held at Cook's Hotel, Ann Arbor, on the 26th, 27th and 28th of March, 1878, commencing at 2 o'clock P. M., on Tuesday, March 26th. It is hoped that every member of the Association will be present during the whole session. All who desire to become members are requested to make application the first day. A general invitation is hereby given to all dentists doing business in Michigan, or anywhere else, to attend.

The officers of the Association are:

G. R. Thomas, *President;* A. T. Metcalf, *Vice President;* E. S. Holmes, *Secretary;* E. S. Holmes, *Treasurer.*

MARYLAND DENTAL COLLEGE.

The fourth annual meeting of the Alumni of the Maryland Dental College will be held in the lecture-room of College, No. 42 N. Calvert Street, Baltimore, Md., on Friday, March 8, 1878, at 11 A. M.

FRED. A. LEVY,
President.

C. E. BUSEY,
Cor. Secretary.

JOHNSTON BROTHERS'

Cone-Journal Hand-Piece

FOR ANY DENTAL ENGINE.

The Greatest Improvement in Dental Engines since 1872.

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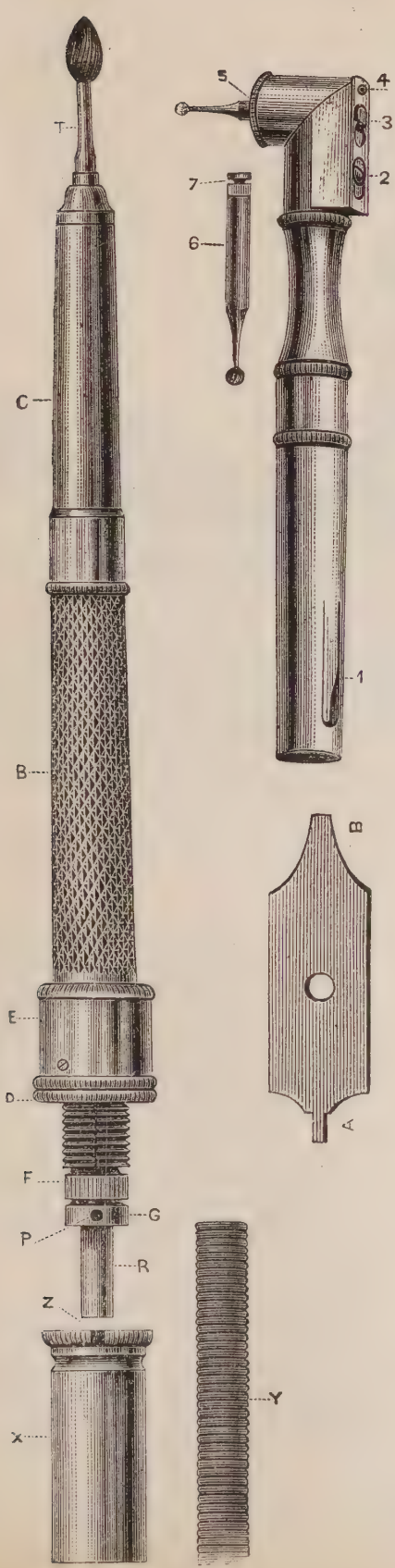


We advise our friends to purchase and use the Cone-Journal Hand-piece, for the following reasons:

1st. It is the only Hand-piece constructed in accordance with mechanical principles, and in such a manner that the spindle will not wear so as to run out of true.

2d. The adjustable conical journal-seat takes up all the wear on the journal, so that the Hand-piece will run as true after many months' wear as when new.

3d. Excepting only that of the suspension engine, it is the only Hand-piece which runs steady enough to carry a disk satisfactorily and without danger of breaking.

4th. It is so constructed that oil cannot find egress, either to the hand of the operator or to the lip of the patient.

5th. The conical journal at the nose of the Hand-piece is placed so far back, and is so protected, that no grit or dirt can reach it.

6th. It is the most durable Hand-piece ever offered to the profession, and will not need frequent repairs; hence it is the cheapest to buy.

It is so proportioned that the various attachments used on the Cable or White Hand-piece can be used with this.

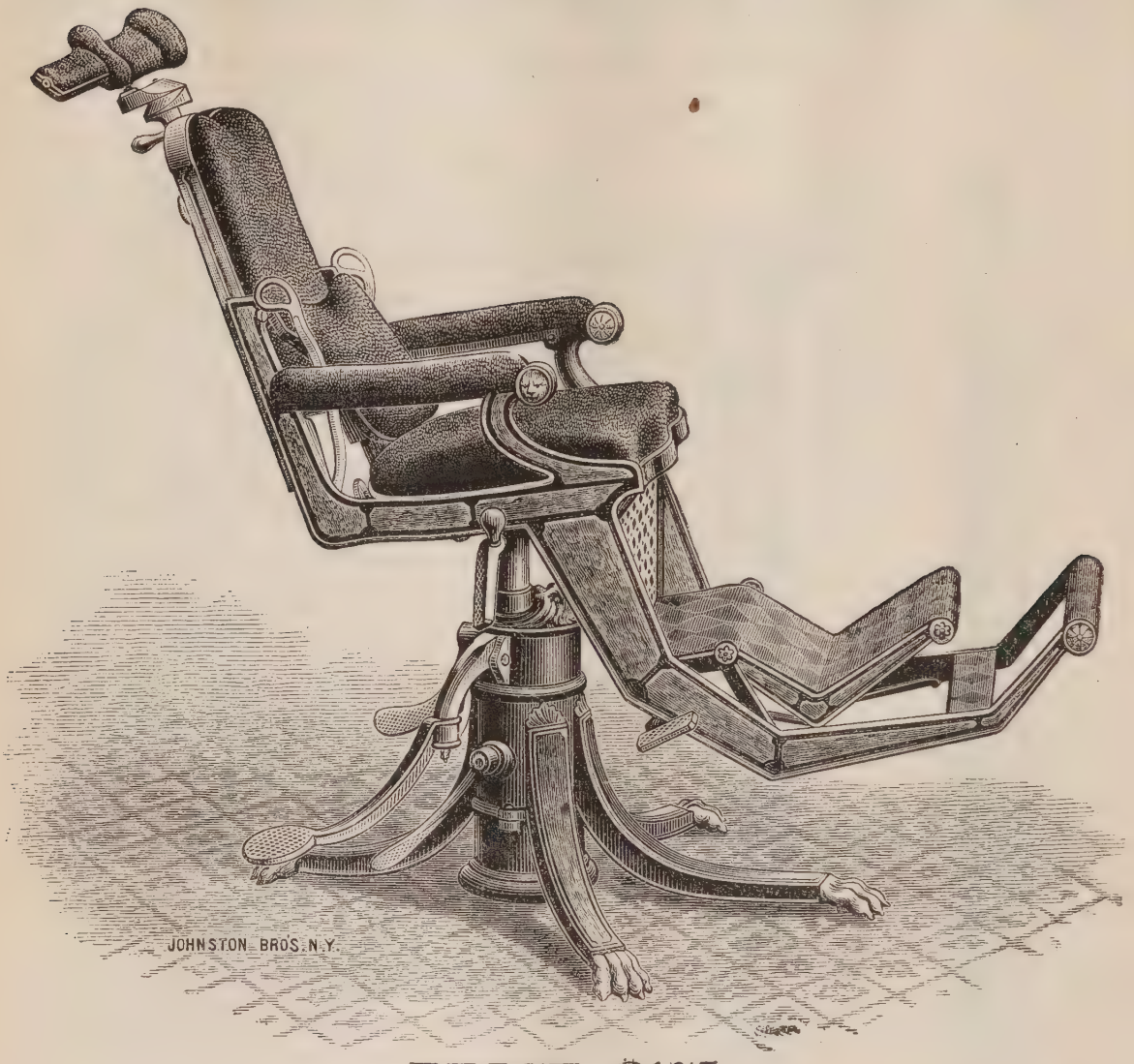
It uses our C (also the Universal) bur, and the White bur can be readily altered to use with this Hand-piece.

Send for Circulars. It is warmly recommended by Drs. Chas. F. Allan, Chas. D. Cook, Geo. L. Mason, Geo. S. Allan, S. G. Perry, N. M. Abbott, Delos Palmer, H. G. Mirick, R. F. Ambler.

Price of Hand-Piece, and one dozen Cavity Burs, $10.00.

Wilkerson Dental Chair.

PATENTED NOV. 20, 1877.



PRICE, $175.

The cut is a good representation of this unique chair. The acknowledged requirements of a first-class dental chair have been here secured by Dr. M. B. Wilkerson—the inventor—by methods showing great originality. All cranks are dispensed with and levers substituted for them. The chair is raised by pressure of the foot on the long lever, which hides the back foot in the cut. This operation requires very little effort, and occupies but eight seconds, and is only equivalent to stepping up eight steps. To lower the chair one has only, with the toe of his boot, to raise the lever just back of that first named, and the chair sinks rapidly and noiselessly until the lever is dropped, when it instantly stops. Except when in use the long lever folds in under the chair.

A touch of the lever in front of that just named, leaves the chair free to rotate through the whole circle. Directly beneath the seat of the chair, and close to the seat, is shown a lever, which, when pressed forward, permits the rocking movement while the lever is held, but whenever released fastens the chair in position.

Thus the three principal movements, elevation, rocking and rotation, are accomplished. The minor movements, all of great importance, however, are the raising or lowering of the back of the chair; the raising in like manner of the head-rest; the slight rocking of the seat of the chair, so as to prevent the patient from sliding forward; the adjustment of the footstool at various lengths and heights; the spring back support to rest the small of the back. This, at will, is converted into a capital child's seat.

An arm-rest is shown at the right of the head-rest. It can be secured on either side of the head-rest at will.

The whole chair is of the most substantial construction and highly ornamental. It will be upholstered in either green or garnet plush or in leather.

This is *not* an hydraulic chair. It has *no pump*, but is raised simply and solely by a lever actuated by the foot. When raised, the elevation of the central column, which supports the chair, tends to produce a vacuum in the chamber through which it passes, and this chamber is immediately filled by a column of oil, which, opening a valve at the bottom of the chamber and directly following up the central column of the chair, blocks it up whenever the lever ceases to raise it higher. Of course, whenever the same valve is tripped, the oil flows back into its receptacle, and the chair is rapidly and noiselessly lowered. *Not one drop of oil* has, ever or can ever find egress from the inner base of the chair to its exterior. So much to silence constant misrepresentations of another dealer.

ADVANTAGES.

1st. It can be raised with the foot of the operator, and by a very slight effort.

2d. It can be raised in half the time of any other dental chair, except the Morrison.

3d. It can be lowered without exertion of force, and as much or as little, or as fast or as slow, as desired, by merely opening a valve.

4th. Its range of movement is superior.

5th. It has a perfect forward and backward movement, so that the patient can be rapidly inclined at any angle by a very slight exertion of force by the hand.

6th. Its arrangement for children is unique and excellent.

7th. Its footstool is readily adapted to the wants of large or small persons.

8th. Its head-rest is completely firm in any position in which it may be placed, has a large range, and is fastened by a single movement of the hand.

9th. The operator can control all its movements without once taking his hand from the mouth of the patient.

10th. It has a perfect rotary movement.

11th. By means of an adjustable foot it will stand firmly on any floor, however uneven.

We have orders for a large number, and are receiving more daily, and entering them in rotation.

JOHNSTON BROS., 1260 Broadway, N. Y.

JOHNSTON BROTHERS & SELBY, 23 N. Charles Street, Baltimore, Md.

Comfort for both Operator and Patient, Rapid Movement, Simplicity of Construction, Great Durability.

The desirable features of a dental chair are almost completely enumerated above. The Morrison Chair answers each of these requirements more completely than any other chair made.

It contributes to the ease of the operator:

1st. By the lightness and rapidity with which the patient is raised or lowered to a convenient position.

2nd. By the form of its back, which is so narrow as to render it unnecessary for the operator to stretch to reach his patient.

3d. By permitting him to drop either arm of the chair entirely out of his way.

4th. By making it possible to operate in either a standing or sitting posture with equal facility.

It affords comfort to the patient:

1st. In the arrangement by which the lower back-pad may be moved forward to support the small of the patient's back.

2nd. The upper back-pad is readily raised or lowered, so as to exactly adapt itself to the wishes of any patient as if the chair had been made for this one person.

3d. By the readiness with which the patient may change the foot-stool from one position to another as suits their notion at the moment, and without disturbing the operator.

If desired this chair can be furnished with either the usual upholstery of dental chairs, or with Turkish upholstery—soft and with springs; or with summer seats and back—of cane; or with separate sets of all of these, which can be changed from season to season by the owner without difficulty or the necessity of employing mechanics of any kind.

Its movements are very rapid.

It can be raised from its lowest position, in which the seat is 15 inches from the floor, to its highest, 42 inches above the floor, in seven seconds. Both low

and high based chairs are here combined in one, giving a vertical range of more than two feet.

It has no equal in operations upon Children.

The child can be raised as high as needed by the tallest operator.

It is provided with a comfortable back and head-rest, exactly as is a grown person.

The foot-stool is quickly adapted to children of any size.

It is extremely simple.

The principal movements of the chair and head-rest are all under control of but three clamps, and the chair is adjusted in height by a single crank.

By one of the above-mentioned clamps it is securely fastened at any desired inclination, and all done in an instant.

It is very durable, because

1. Being made almost entirely of metal, open joints or season cracks are impossible.

2. The upholstery of this chair is so arranged that it can be renewed, by exchange of the upholstered parts, without leaving the rooms of the operator and at moderate expense.

ACCESSORIES.

CASTORS.—To secure the *rotary movement* for such persons as desire it, legs have been cast, having recesses in the feet, into which Castors are inserted. The castors in the front legs roll laterally only, so that by them the patient's face may be turned to the light. When in the right position a locking device permits you to fasten the castors so that they cannot be moved until unlocked. The castors in the back feet are so placed as to revolve only back and forward, so that while they permit you to easily roll the chair like a wheelbarrow out of position if you wish to sweep, they cannot be moved by the force exerted in plugging a tooth.

NARROW BACK PAD.—To be used sometimes instead of the top pad, and sometimes as a third pad when the back of the chair is stretched to full length.

SPITTOON ATTACHMENT—see in the cut—is a cheap and convenient substitute for a separate spittoon. Is more convenient and costs less.

HEAD-REST.—The Morrison Head-Rest is a *thoroughly* good one, and has given general satisfaction. It is supplied with the chair if we are not otherwise directed, and the price of the chair as named includes this rest. The Johnston Head-Rest is *our latest*, and is everywhere approved. It can be had with the chair at an extra cost of $8.00. It is shown in the cuts.

EXTRA UPHOLSTERY.

Turkish Upholstery.

Some persons having desired a softer style of upholstery than is usual in dental chairs, we have adopted, after many experiments, a modification of what is usually known as the Turkish chair. The seat is made about four inches higher in front than at the back, and both it and the lower back are made very soft by the liberal use of steel springs and hair, the edges being kept full by a piece of heavy spring wire which is built into the upholstery.

The perpendicular edges are covered with a puffing to match, and "set off" with handsome silk cord.

The arms and upper back pads are made heavier than usual, and are puffed and corded to match the seat.

Real Morocco.

We also have produced a very elegant article by the use of real morocco, handsomely embossed. It is durable and particularly desirable for warm climates.

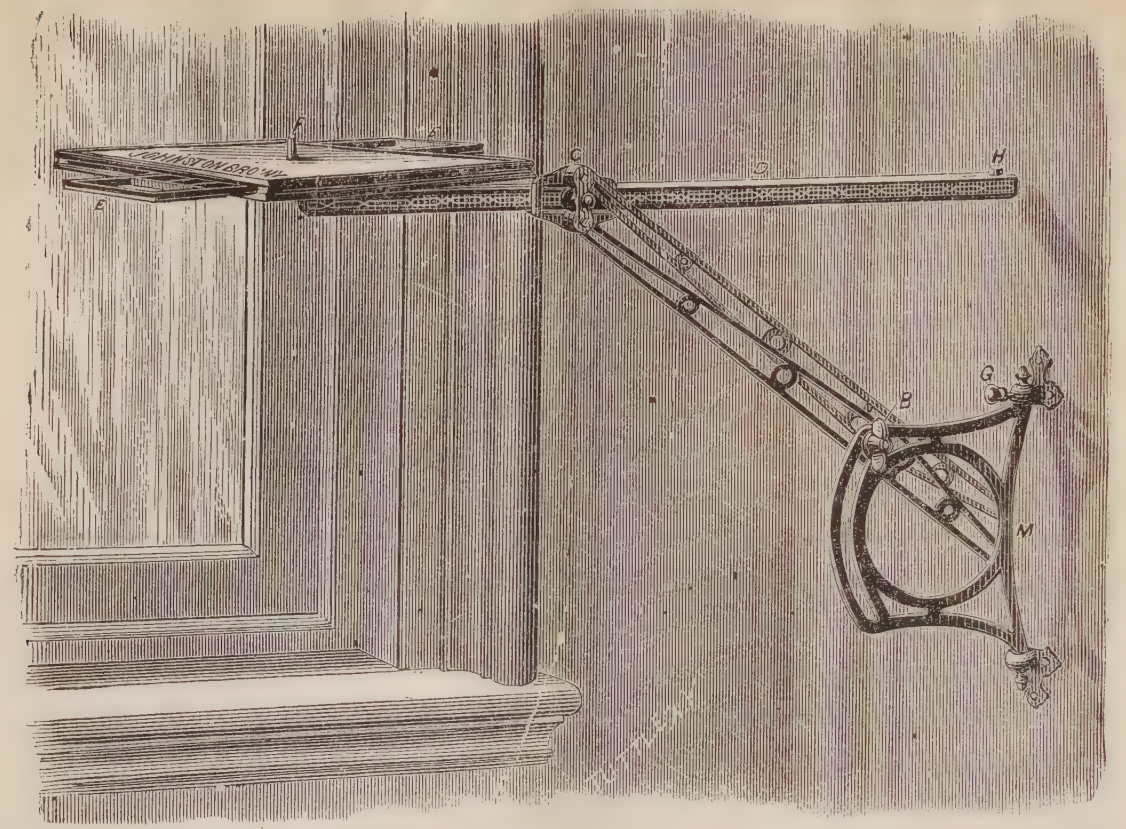
PRICES.

In fine green or garnet plush—with Morrison Head-rest	$ 150.00
Boxing	5.00
To which price add, if ordered:	
With Castors	10.00
With Johnston Head-rest, instead of Morrison	8.00
With extra back-pad	4.50
With spittoon attachment and porcelain cuspador	8.00
With nickled metallic cuspador and gold trap	10.00
With nickled metallic cuspador and gold trap, and nickled spittoon attachment	18.00
With Turkish upholstery	15.00
Real morocco embossed	10.00

JOHNSTON BROTHERS,

85 **Broadway, cor. 32d St., N. Y.**

MORRISON DENTAL BRACKET.



PRICES.

With Black Walnut Table, 12 inches square.....$25.00.
With Rosewood Table, 14 inches square, and Velvet Top, and Drawers about five-eighth inch deep, lined with Leather..... 40.00.
The Rosewood Table alone, as above, to fit any Morrison Bracket..... 17.00.
Boxing..... .....$1.00.

The cut represents the table in its highest position, and distant from the wall a little more than half the distance it is capable of taking. By loosening the thumb-screw B, and allowing it to rest in the bottom of the slot, (instead of at the top as represented here,) the table will occupy a position as much below M as it now does above the same point. The extreme range, that is, the distance between the table when at its highest and its lowest position, is 24 inches.

M represents a metal frame which is secured to the wall or other support by screws. It swings from side to side as a gate on its hinges. C. M. represent light but strong metallic arms, hinged at M as a centre and moving up or down. At B is a thumb-screw passing through a slot in the frame M. By it the arms can be firmly clamped at any desired height.

At C is a slide-rest through which the hollow rod D passes freely, and may be clamped at any distance from its ends. At one end of this bar a square table is supported, having in it foil and instrument drawers. This table is capable of rotation round F, which is the burner of an alcohol lamp, the alcohol being contained in D and introduced at its further extremity H. Among the advantages of this bracket are these:

1st. It combines a greater variety of range and movement than any other.
2d. It is rigid in whatever position it is clamped, and will hold 15 lbs. with steadiness.
3d. It provides a clean receptacle for foil and instruments.
4th. It is obvious that a square table is very much more convenient as an instrument stand than a round one.
5th. Its drawers extend through the table and can be opened from either side.
6th. To those having a Morrison Chair it is almost indispensable, as it will follow the chair to either its lowest or its highest position.

It is handsomely ornamented and nickel-plated throughout, so that it is a very beautiful addition to the furniture of the operating room.

JOHNSTON BROTHERS,
Broadway, cor. 32d St., N. Y.

HARVARD UNIVERSITY.

DENTAL DEPARTMENT,

BOSTON, MASS., 1878-79.

The plan of study of this School has been radically changed. Instead of the usual oral examinations at the end of the course, written examinations are had at the end of each year on the subjects pursued during the year, and instead of the customary repetition each year of the lectures and studies of the preceding year, the course is progressive over a period of two years, and the student is required to pass a satisfactory examination in the first year studies before being allowed to proceed to the next. At the end of the course a satisfactory examination must have been passed in all the subjects.

The new year begins Sept. 25th, 1878, and ends the last Wednesday in June, 1879. It is divided into two equal terms, with a recess of one week at Christmas, and another in April.

The University Degree, D.M.D (*Dentariæ Medicinæ Doctor*), is conferred upon those who fulfill the requirements.

FEES.

There are no fees for matriculation, for the diploma, nor for the demonstrators. For the first year a student is a member of the school, the fee is $200; for the second year, $150; for any subsequent year, $50.

For information address,

THOS. H. CHANDLER, Dean,

222 TREMONT ST., BOSTON, MASS.

FRENCH CROWN AMALGAM.

The Manufacturer says of it: The Amalgam is composed of materials which the dental profession at large recognize as the best (except gold) for filling teeth. It is of finest quality. It has the merit of becoming hard in fifteen minutes after being prepared for use, and does not change color or shrink.

PRICES.

1 oz. box, with mercury	$3 00
⅔ oz. " " "	2 00
⅓ oz. in envelopes	1 00

For sale at wholesale and retail.

JOHNSTON BROS., 1260 Broadway, N. Y.

JOHNSTON BROTHERS' LAVA STRIPS.

PATENT APPLIED FOR.

For finishing fillings, a new and unequaled polishing material.

Thinner, more convenient and more efficient than corundum tape.

Price, per Box.....50 cts.

JOHNSTON BROS., 1260 Broadway, N. Y.

LIQUID NITROUS OXIDE.

N O

No other equally safe anæsthetic is known. While Chloroform and Ether are killing scores, if not hundreds, annually, Nitrous Oxide, although used many times as frequently as either of the other anæsthetics named, proves itself entirely harmless; and this too, though very commonly an impure article of Nitrous Oxide is exhibited. The Nitrate of Ammonia ordinarily furnished in the market is far from being chemically pure, and the products of its decomposition are too often impure Nitrous Oxide and Bin-oxide of Nitrogen. The latter is a gas of which the chemist, Brande, says:—"It is rapidly fatal to animals"—and again, (of the reddish fumes which result from its admixture with air, which fumes most dentists have seen while making Nitrous Oxide,) "These are fumes of Nitrous Acid, ($NO^2+2O=NO^4$). They have a peculiar suffocating odor, and are highly irritating and corrosive—*care should be taken that they are not breathed, even in a dilute state.*" All danger from this source may be avoided, however, by making use of *Liquid* Nitrous Oxide, which, being prepared constantly and in large quantities, under the direct supervision of a chemist, is certain to be pure. *No instance* of fatal results following the administration of pure Liquid Nitrous Oxide Gas is known. The following statistics, showing the comparative safety of several of the leading anæsthetics, have been before given by us, but cannot be too often brought to the notice of those who are constantly called upon to relieve suffering by means of these agents.

From a careful examination of the statistics of 200,893 cases, Prof. E. Andrews gives, in the *Chicago Medical Examiner*, the following estimate of the relative danger from different anæsthetics:

Sulphuric Ether	1 death to	23,204	administrations.
Chloroform	1 "	2,723	"
Mixed Chloroform and Ether	1 "	5,588	"
Bi-chloride of Methylene	1 "	7,000	"
NITROUS OXIDE	**no Deaths in**	**75,000**	"

Edward R. Squibb, M.D., than whom our country has no more able pharmaceutist and toxicologist, in a lecture on anæsthetics before the Medical Society of the State of New York, says: "Nitrous Oxide was the first anæsthetic; and the safety and certainty of its effects, even in inexperienced hands, for all momentary operations, and the promptness with which persons recover from its use, render it perhaps the most important of all anæsthetics, because destined to relieve a greater aggregate amount of pain, *with greater safety*, than any other agent."

Again—"If the surgeon considers the safety and saving of pain to his patient, first, and his own convenience in operating, second, he will hesitate before passing over such an agent as Nitrous Oxide."

It may be well just here to call attention to the fact that, when ether or chloroform is administered, it is not at all uncommon for the air about the patient to become so charged with the vapor as to somewhat affect the surgeon, taking from him perfect clearness of mental operation, and of the senses, and frequently leaving him with headache, and even nausea.

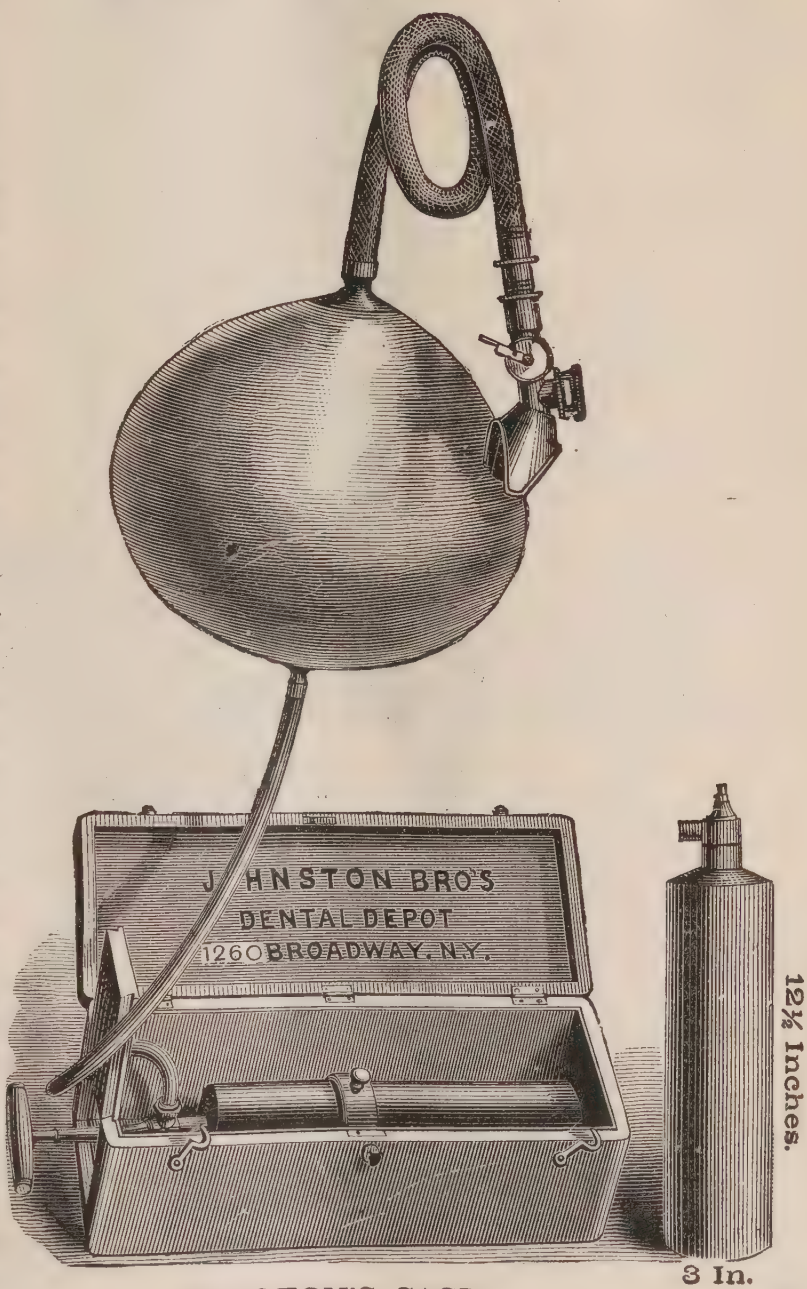
When Nitrous Oxide is given, nothing of this occurs, and the surgeon is in no way conscious of the presence of the anæsthetic, except as he sees its effects on his patient. This, we think, is a convenience to the surgeon.

Numerous and repeated trials of the Liquid Nitrous Oxide in capital operations in surgery, (as well as in momentary operations), during the two years just passed, attest the

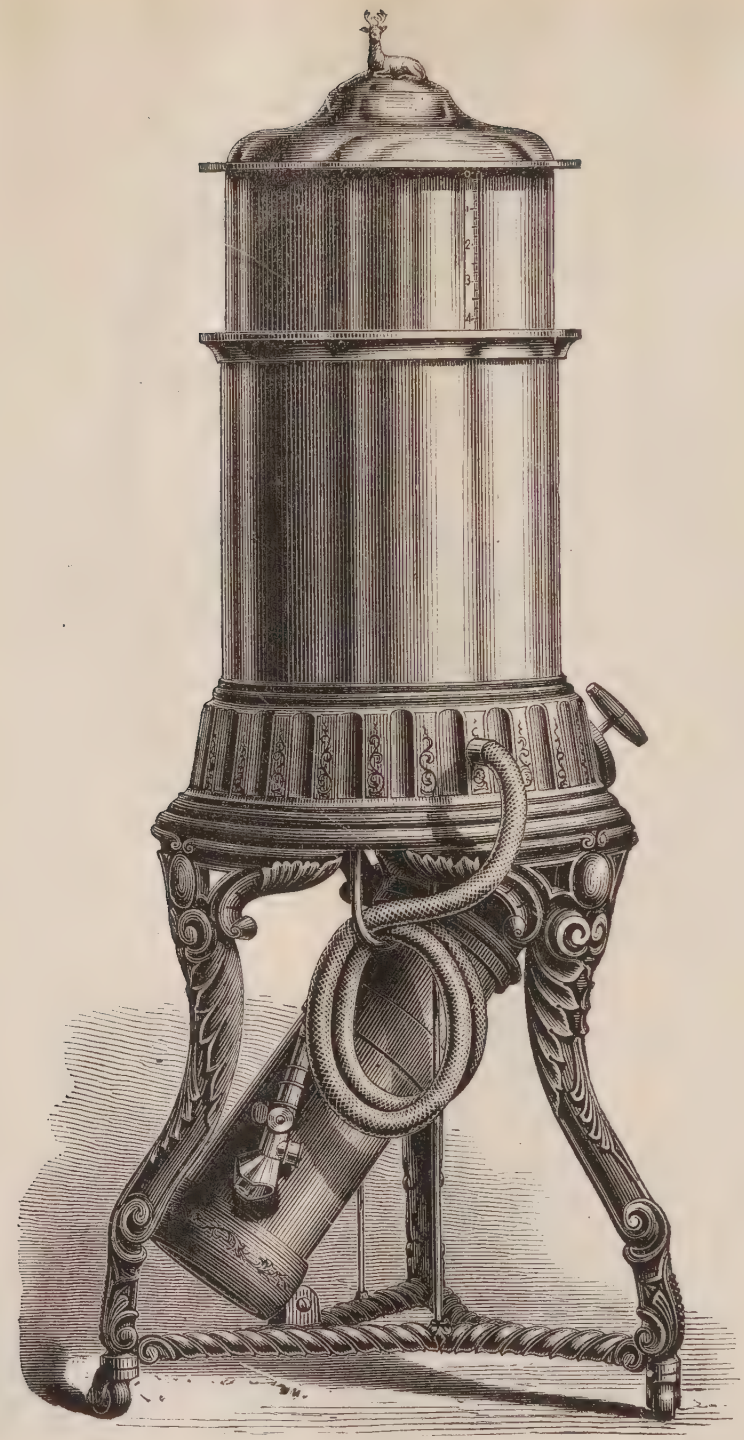
perfect adaptability of this agent to all cases where an anæsthetic is needed, and the time is not very distant when it will supplant its cheaper, but dangerous rivals.

Two styles of apparatus are provided for its administration. The most generally used, because of its cheapness and portability, is the SURGEON'S CASE.

This comprises a strong cylinder containing One Hundred Gallons of Gas; a strong morocco covered case, provided with an iron ring and set screw, by which the iron cylinder is held in place during use, and its delicate valve protected from injury; also, a rubber bag with rubber tube at one end for admission of gas, while an inhaling tube, handsomely covered on its outside, and provided against any possibility of a collapse by a tin-coated spiral of wire on its inside, is fastened at its opposite end; a metallic inhaler—nickled—having two spring valves, which answer to the slightest breath, either of inspiration or exhalation. The inhaler also has a two-way stop-cock or ground valve so arranged, that the gas being shut off, the patient may be allowed to breathe air until all alarm is dissipated, and then, by an unobtrusive movement of the fingers without previous notice, the air may be excluded and gas admitted. It contains also, a nickel-plated wrench and a nickel-plated key. In fact *all* the apparatus necessary for administering the gas. The whole case and contents weighs about fifteen pounds. This is here shown as open, and the bag which receives the gas from the cylinder, and from which it is exhibited to the patient, is represented as filled, and suspended above the case. The cylinder is also shown as standing at the side of the case. This is the simplest and most popular form of apparatus, and will be everywhere welcomed—because of its portability for use outside of the operating room.



SURGEON'S CASE.



NICKEL-PLATED GASOMETER

AND ORNAMENTED STAND

FOR LIQUID NITROUS OXIDE.

NICKEL-PLATED GASOMETER.

This style of apparatus is especially designed for those who use large quantities of Nitrous Oxide, or who may desire a highly ornamental piece of office furniture, coupled with a *really economical* gas apparatus, the gas being furnished in 1,000 gallon cylinders, at a reduction of 25 per cent. in price.

The cut on the opposite page represents the nickel-plated gasometer, mounted on a stand, with a 1,000 gallon cylinder, in position, under the gasometer.

Heretofore, gasometers have been so unsightly, that it has been considered desirable to place them in an adjoining room or behind a screen; we take pleasure now in offering to the profession a gasometer so handsomely gotten up, that it will be an ornament to any office, and at the same time so constructed, as to be vastly superior to any apparatus heretofore used. The gasometer will, when full, hold 10 gallons of gas —this is sufficient to completely anæsthetize any patient. The usual amount of gas given to a patient is from 3 to 5 gallons.

If it is desirable to keep the patient under the influence of the anæsthetic for any length of time, (as in a surgical operation), the operator has under his control 1,000 gallons of gas, by merely turning the key seen in the cut at the right. The gasometer is nickel-plated, highly polished, and mounted on a carved iron stand, which is japanned and ornamented with bronze.

On the bell of the gasometer there is a scale graduated in gallons, and fractions of a gallon, so that the operator can readily see how much gas he has administered.

Another valuable feature in this gasometer, is a peculiar water-check or valve, so arranged that though the gas will flow freely on the lightest inspiration at the inhaler, it is instantly and automatically shut off by the water when the patient stops breathing.

This does away with the necessity of closing any stop-cock, and prevents all waste of gas; it also saves the dentist's time at the most critical moment, as he has only, after having administered the gas, to lay aside the inhaler and proceed at once to operate without the necessity of shutting any stop-cock. The stand is so constructed that a small (100 gallon) cylinder can be used while the large cylinder is being re-filled.

We should also call attention to the fact, that there is no liability to loss of gas from leakage, caused by the operator's leaving the valve of the cylinder open, for if there is such escape from the cylinder, the bell of the gasometer will rise, and the operator will have his attention called to the waste, thus enabling him to correct the difficulty at once.

The whole apparatus is mounted on castors, and can be readily moved.

This apparatus is especially desirable where large quantities of nitrous oxide are used, or where it must be sent a great distance. In this form it is best to ship it by *fast freight*—which makes the cost of transportation very light. The gas can be kept for any length of time, and is constantly on hand *and always of the best quality.*

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.

Why Nitrous Oxide should be preferred to Ether or Chloroform.

1st. It is far safer—see foregoing statistics. Dr. Colton reports having administered it to thousands of patients, without a single accident.

2d. It acts quickly ; from one to two minutes being generally sufficient to bring a person completely under its influence.

3d. It seldom excites a patient to violence—a matter of great importance.

4th. Nausea is not often excited, even during a long operation. Eating, however, should not immediately precede the administration of the gas. It is contended by some operators of large experience, that *pure* nitrous oxide *never* causes nausea. In operations of the eye, or in the pelvic region, this peculiarity renders the gas invaluable, and it always is of much value to the patient's feelings.

5th. The shock given to the system by other anæsthetics, is almost as severe as the operation itself, and a slow return to consciousness and the normal condition detrimental to the recovery of the patient. Nitrous Oxide frees itself from the system as speedily as it produces its effects, and so adds nothing to the perils of surgery.

6th. It is no small advantage, as before recited, that, while using Nitrous Oxide, the operator feels no inconvenience from its effects, as he does not inhale it, while he cannot altogether escape the fumes of ether or chloroform.

REVISED PRICES.

Complete Apparatus—Surgeon's Case, with Metallic Inhaler	**No. 1**	$42 00
Complete Apparatus—Surgeon's Case, with extra sized Bag and Metallic Inhaler	**No. 2**	44 00

Boxing either, $1.00.

Each complete apparatus includes a 100 gallon cylinder, filled with Liquid Nitrous Oxide.

Cylinder with 100 gallons of Gas	16 00
Refilling Cylinder	6 00
Nickel-Plated Gasometer, with ornamented iron stand	128 00
Necessary adjuncts, (including Union Nut, Key-Wrench, Inhaler and covered Tubing)	12 00
1000 Gallon Cylinder	36 00

The above cylinder may contain more than one thousand gallons—say from 1000 to 1200 gallons—for which the price will be at the rate of 4½ cents per gallon, which is 25 per cent. less than the price in small cylinders.

Contents, if 1000 gallons, would be, at 4½ cents	45 00
Morocco covered case, with ring and thumb screw, velvet lined	12 00
Polished bl'k walnut " " " " "	13 00

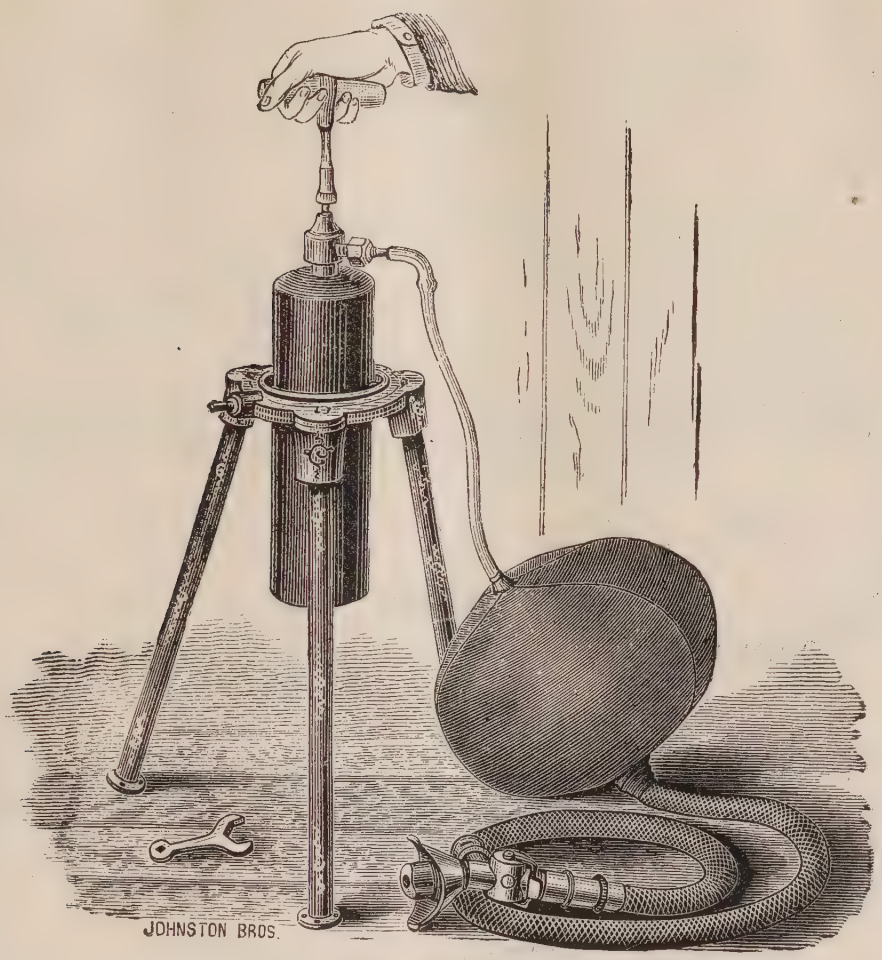
Of these latter we have only a limited number.

Rubber Bag, with covered inhaler tubing, (about 4 gall. capacity)	5 00
Rubber Bag, with covered inhaler tubing, extra size	7 00
Inhaler, latest style, with two way stop cock, adapted to the use of both dentists and surgeons, with connection	9 50
Key, Nickel Plated	1 50
Wrench, "	50
Union, Nickel Plated, (nut and tube), for connecting cylinder and gas bag	1 50
Covered Inhaler Tubing, per foot	50
Plated Connection to fit old style Inhaler	1 00

JOHNSTON BROS.,

Broadway, cor. 32d St., N. Y.

NITROUS OXIDE GAS.



100 GALLON CYLINDER TRIPOD.

PRICE, $4.00.

We here show a representation of a tripod, handsomely japanned and ornamented, which is designed to hold the cylinder while in use, and is less expensive than the Morocco case, of the Surgeon's case.

Price adapted to	100	gall. cylinder	$4.00.
" " "	500	" "	6.00.
" " "	1000	" "	8.00.

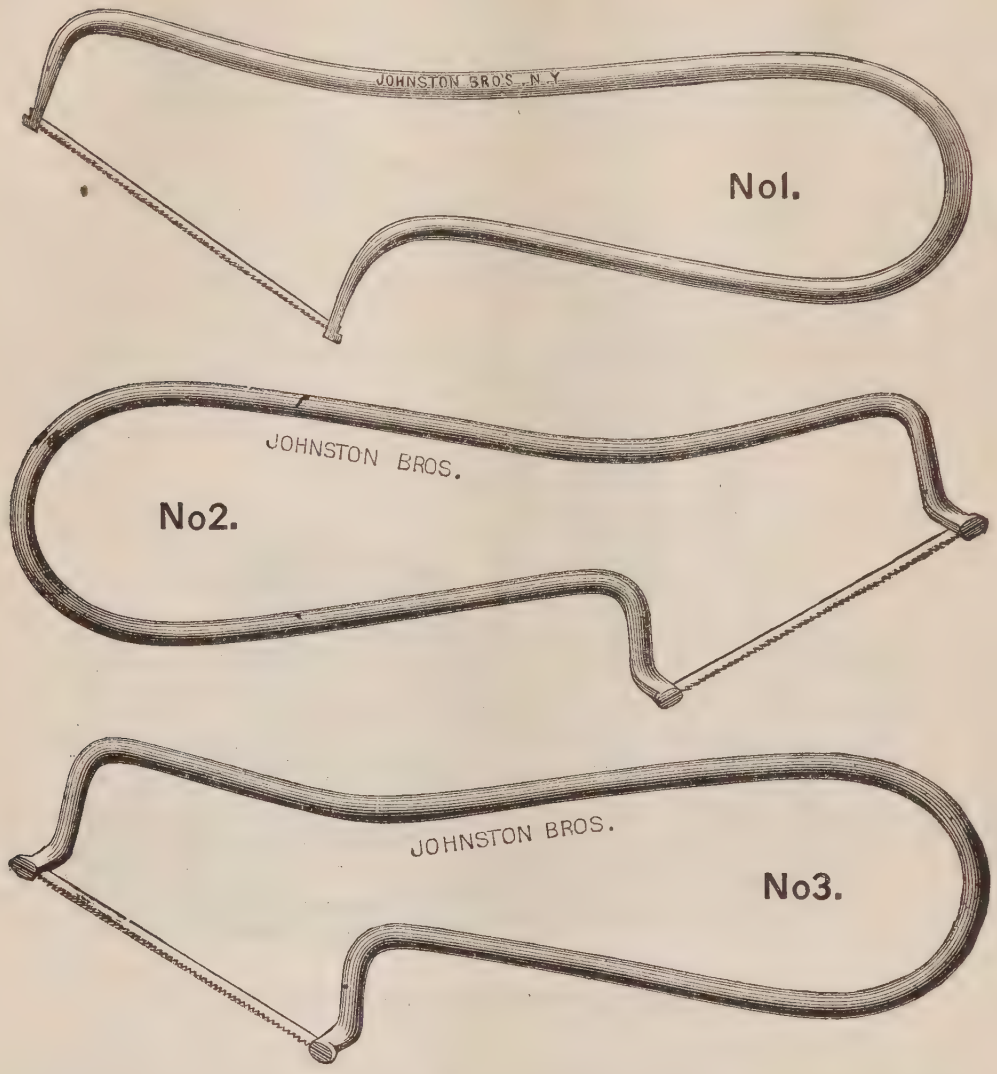
ADJUNCTS NECESSARY WITH EITHER TRIPOD, VIZ.,

Bag, Inhaler, Key, Union-Nut and Wrench..... .....$17.00

For other prices of Gas apparatus, see pages following.

CLAPP'S SAW FRAME.

PATENT APPLIED FOR.



In the form shown here this instrument, the device of Dr. Dwight M. Clapp, will be found very useful as a saw frame. The saws are firmly held in place, but can at pleasure be detached or inserted by pressing the wires of the handle together, the thumb being placed just beyond the extremity of the saw, on the handle, for that purpose.

These saws are in many cases superior to files in finishing fillings. Being much thinner than any file, they will pass between teeth, leaving less space (a thing often very desirable, particularly at the cutting edges of the teeth), yet sufficient to be followed by emery cloth or tape.

The saw can often be used between teeth that are crowded, where a file cannot. The saw being flexible—hard enough to cut the gold but not the teeth—will follow the space between, although it be quite irregular. It will cut much faster than a file and is less liable to break.

PRICES.

Saw Frame	50 cts.
Saws, per dozen	25 "
Frame and two dozen saws, postage paid	$1 00

JOHNSTON BROS.,

1260 Broadway, cor. 32d St., N. Y.

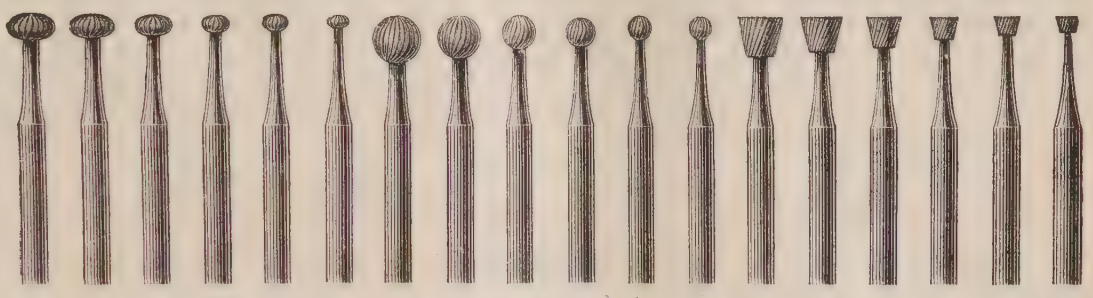
CATALOGUE OF
Instruments for Dental Engines.

Each Bur will fit either the Morrison, Suspension or White Engine.

Patented September 10, 1872, February 24, 1874.

PLUG FINISHING BURS.

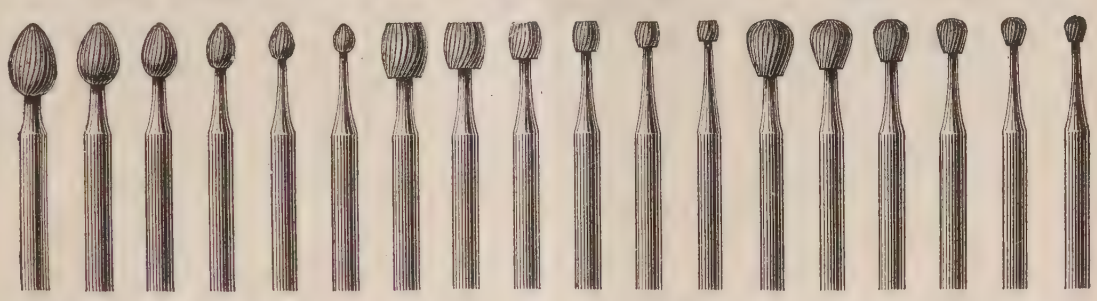
Oval. **Round.** **Inverted Cone.**



0 1 2 3 4 5 5¾ 6 7 8 9 10 10¾ 11 12 13 14 14¼

60 cts. 50 cents. 60 cts. 50 cents. 60 cts. 50 cents.

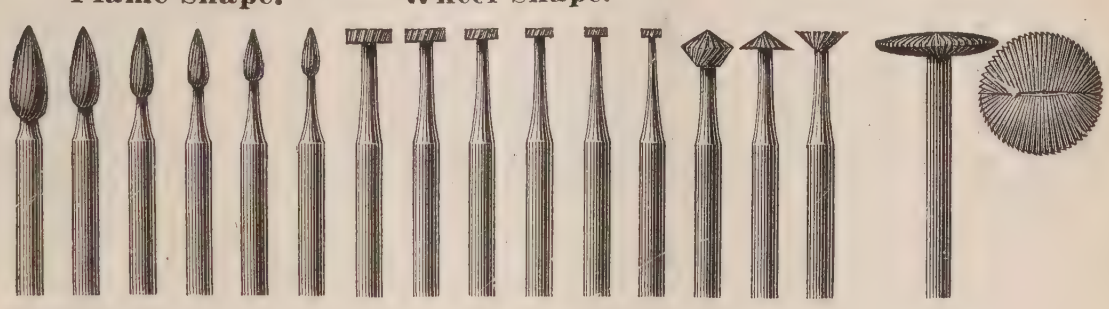
Bud Shape. **Barrel Shape.** **Pear Shape.**



14¾ 15 16 17 18 19 19¾ 20 21 22 23 23¼ 23¾ 24 25 26 27 28

60 cts. 50 cents. 60 cts. 50 cents 60 cts. 50 cents.

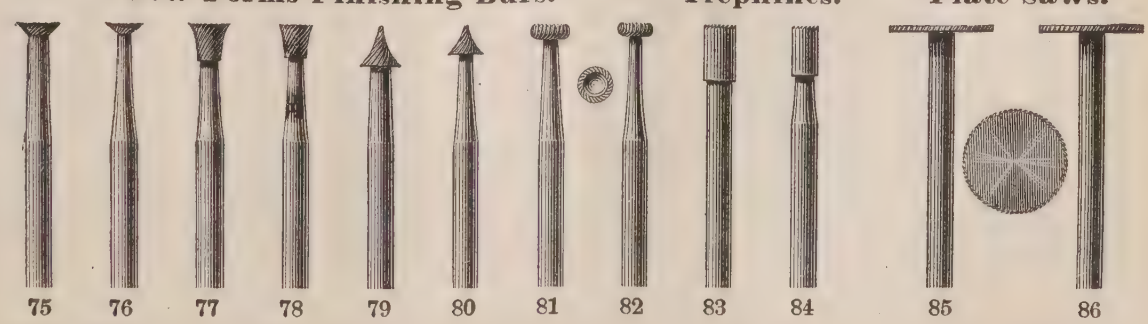
Flame Shape. **Wheel Shape.**



29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44

60 cts. 50 cents. 60 cents. 50 cents. 60 cents. $1.25.

New Forms Finishing Burs. **Trephines.** **Plate Saws.**

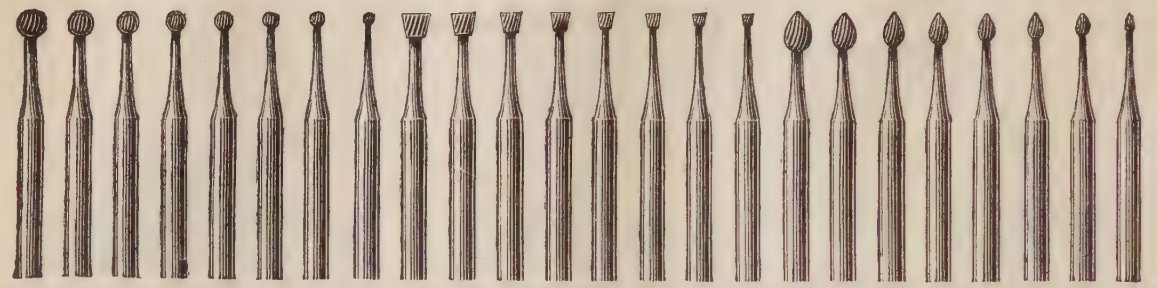


75 76 77 78 79 80 81 82 83 84 85 86

60 cents each. 75 cts. each. $1.00 each.

CAVITY INSTRUMENTS.

Round. **Inverted Cone.** **Bud Shaped.**

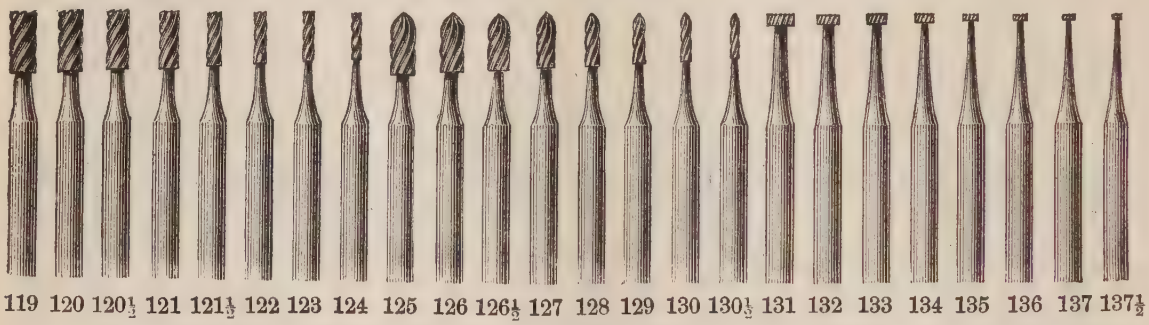


100 101 102 103 104 105 106 106½ 107 108 109 110 111 112 113 113½ 114 115 115½ 116 117 118 118½ 118¾

25 cents each. 25 cents each. 25 cents each.

For extra large sizes of these forms see below, Nos. 154 to 177.

Square Fissure. **Pointed Fissure.** **Wheel.**

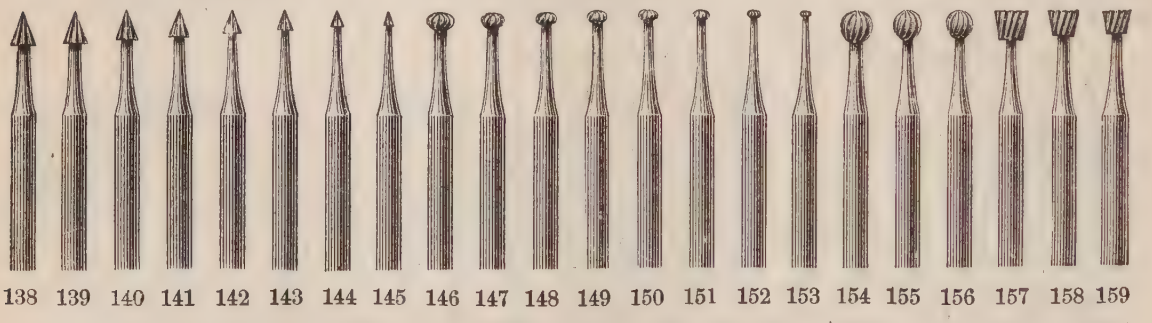


119 120 120½ 121 121½ 122 123 124 125 126 126½ 127 128 129 130 130½ 131 132 133 134 135 136 137 137½

25 cents each. 25 cents each. 25 cents each.

For extra large sizes of these forms see below, Nos. 154 to 177.

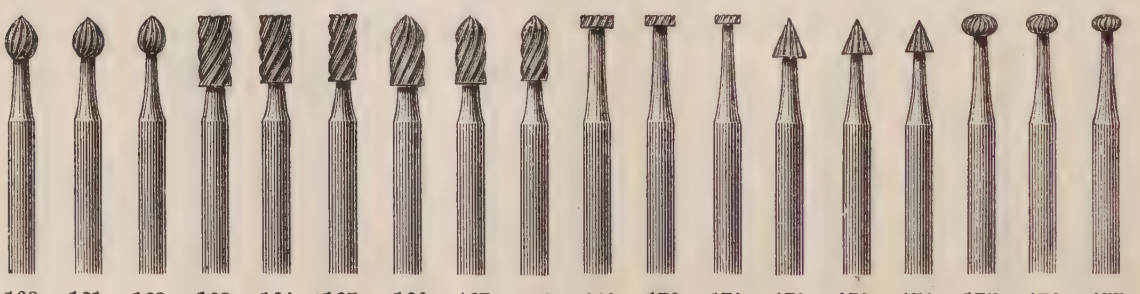
Cone Shaped. **Oval.** **Extra Sizes.**



138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159

25 cents each. 25 cents each. 35 cents each.

Extra Sizes of Various Shapes.

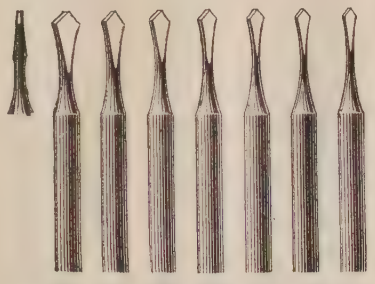


160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177

35 cents each.

CAVITY INSTRUMENTS.

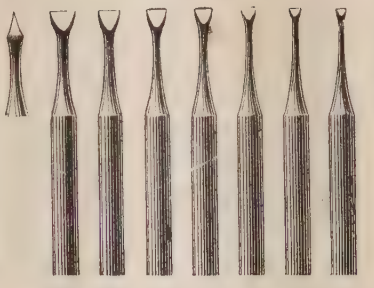
Spear Shaped Drills.



200 201 202 203 204 205 206

25 cents each.

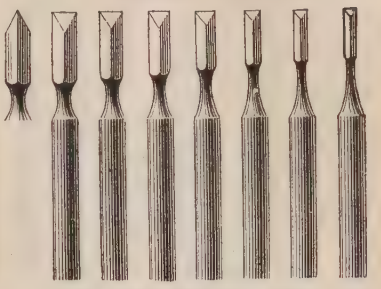
Spade Drills.



207 208 209 210 211 212 213

25 cents each.

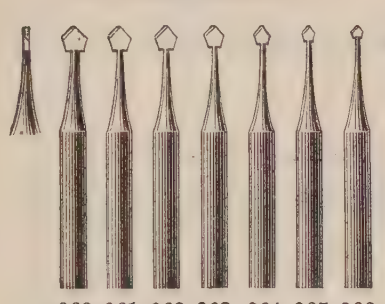
Square Drills.



213¾ 214 214½ 215 216 217 218

25 cents eaeh.

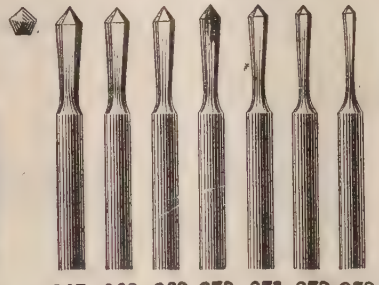
Forbes' Drills.



260 261 262 263 264 265 266

25 cents each.

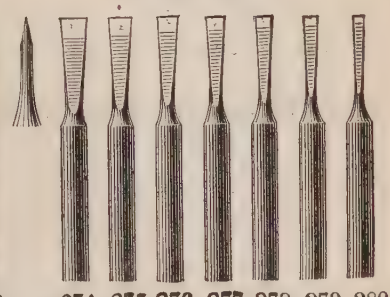
Five Sided Drills.



267 268 269 270 271 272 273

25 cents each.

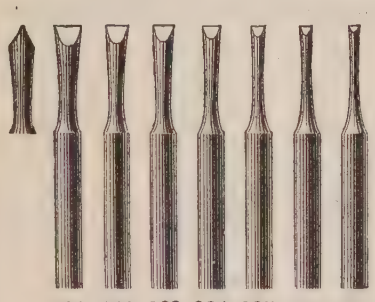
Flat Drills.



274 275 276 277 278 279 280

25 cents each.

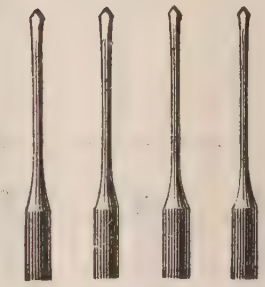
Round Drills.



281 282 283 284 285 286 287

25 cents each.

Drills for Mack's Screws.



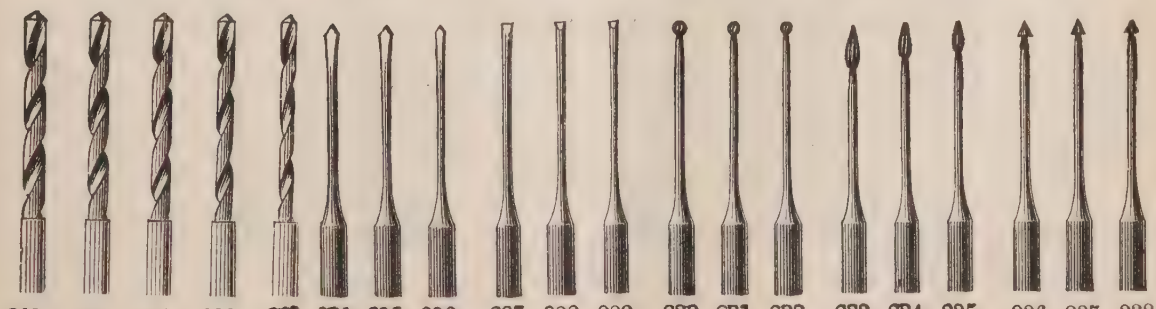
288 289 290 291

40 cents each.

No. 291 is for Gold Screw No. 1
" 290 " " " " 2
" 289 " " " " 3
" 288 " Pivoting Screws.

NERVE INSTRUMENTS.

Twist Drills. **Spear Point Drills** **Round Drills** **Round Burs.** **Flame Shape Burs.** **Cone Burs.**

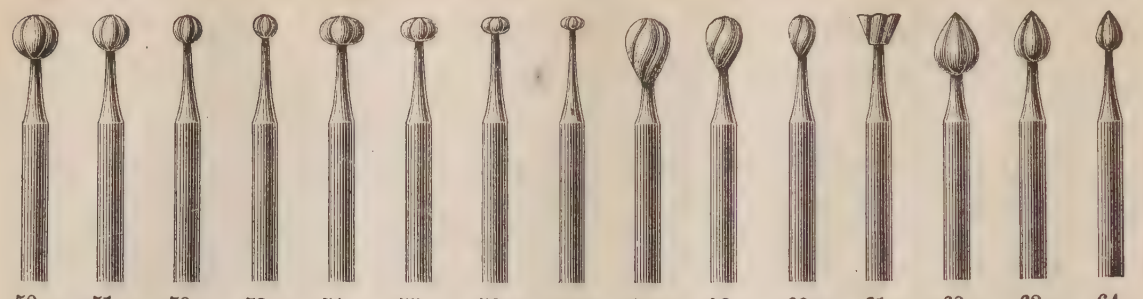


219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238

40 cents each.

Miscellaneous Finishing Instruments.

Burnishers.



75 cents each.

Same sizes, not corrugated, 50 cents each.

Screw Mandrel.

No. 66.

25 cents each.

Screw Mandrel, without Collar.

No. 65.

13 cents.

Port[illegible]lisher.

No. 67.

Screw Socket, Nickel Plated, 35 cents each.

Plain Chuck for Wood Points.

No. 69.

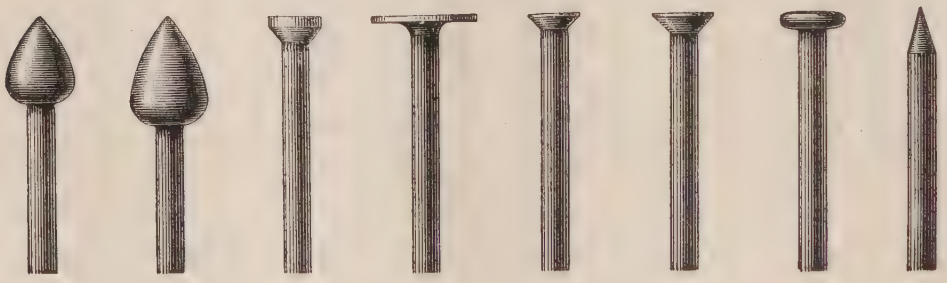
Plated, 35 cents each.
Plain, 25 " "

Parting Nut Mandrel.

No. 68.

Nickel Plated, 40 cents each.
Plain, 30 " "

Wood Polishing Points.



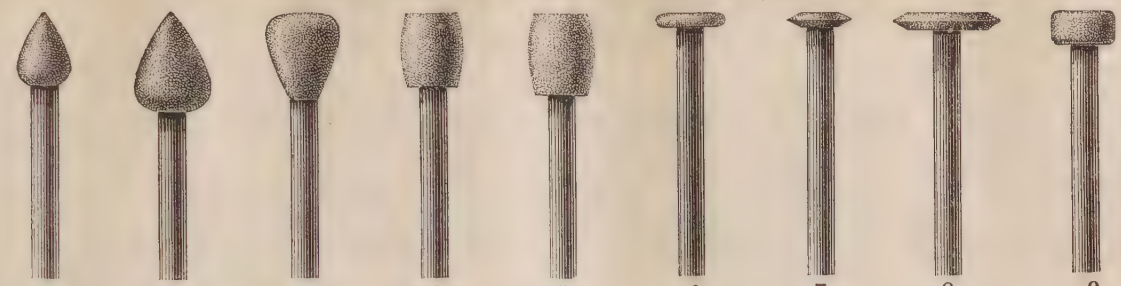
Per Box of 100, assorted, $1.25.

Boxwood Disks.

Price, per dozen, $1.00.

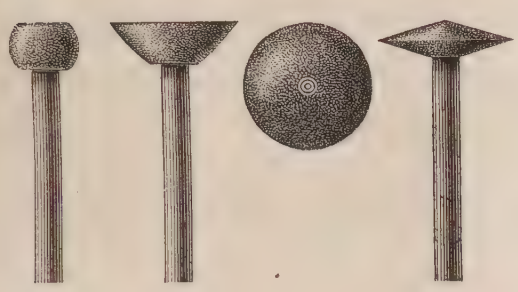
CORUNDUM POINTS.

Forms by Dr. A. L. Northrop.



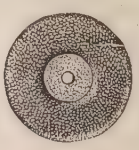
1 2 3 4 5 6 7 8 9

Rubber Disks.

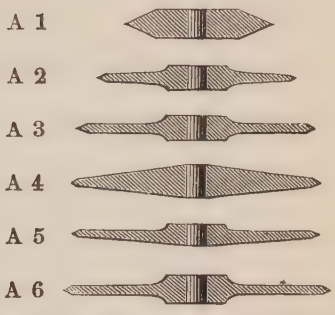


10 11 12

Very thin, 7-16 in. diameter.



13

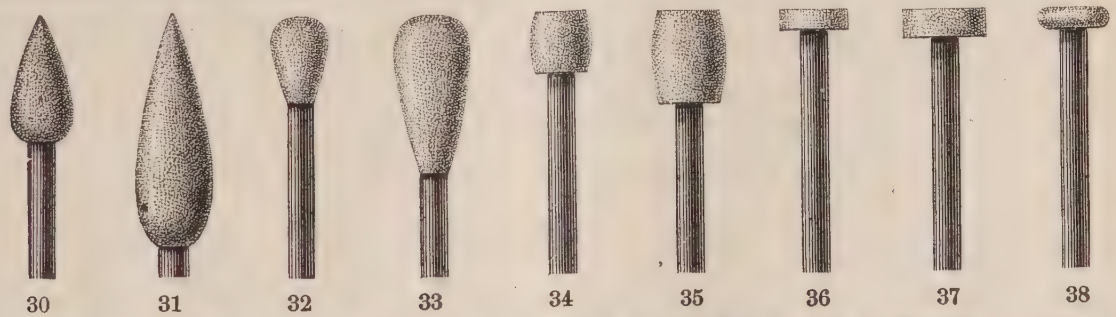


Mounted, per set	$1 50	Wheels as in cut No. 13, per dozen	$1 50
Mounted, per dozen	1 50	Or Mounted, per dozen	2 75
Not Mounted, per set	75	Rubber Disks, Hard, per dozen }	1 20
Not Mounted, per dozen	75	Rubber Disks, Soft, per dozen }	

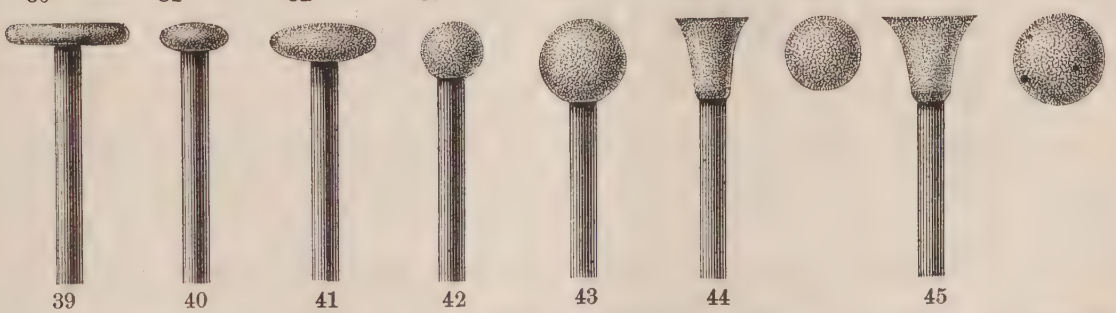
Soft Rubber Points, Shapes of Corundum Points, per dozen.....75 cents.

ARKANSAS AND HINDOSTAN STONE.

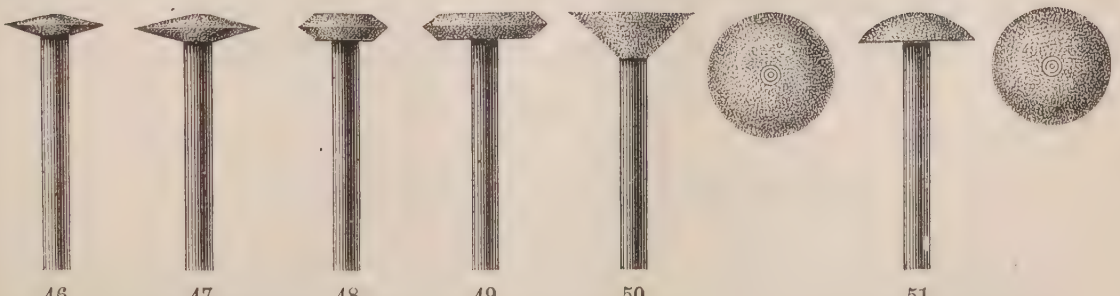
These are kept in stock, mounted on Mandrels, of the forms represented below. Scotch Stones will be made to order of any of the same forms, but this Stone is so soft, that we do not deem them desirable except for such shapes as are without sharp angles.



30 31 32 33 34 35 36 37 38



39 40 41 42 43 44 45



46 47 48 49 50 51

Arkansas Stones, $1.00 each. Hindostan Stones, 50 cents each. Scotch Stones, 30 cents each.

STONED BURS.

The teeth of these Burs are laid out with great accuracy, and then filed to *exactly equal length,* but are not brought to a cutting edge. The Bur is next tempered, and each tooth *afterward* stoned to a fine edge. This secures a Bur perfect in all its cutting edges, and unequaled by anything of the Bur kind. Those who have used these most, rarely buy any other kind, and assure us that they find true economy, as well as great satisfaction in their use.

We invite the fullest examination of all of our Engine Instruments, as regards

The quality of the steel from which they are made.
The shape and finish of the cutting edge.
Their temper.
The rapidity with which they cut.
Their durability.

The shaft of each instrument is *round and highly finished*, and can therefore be used without unreasonable and unnecessary injury to the nose of the hand-piece, which injury occasions unsteadiness in all the uses of the Engine.

They will *bear* examination in *quality* and *price.*

MINIM BURS.

It is impossible to accurately represent by cuts the smallest sizes of Burs that we make. We offer Cavity Burs, either Round, Inverted Cone, Bud-Shaped, Wheel, Cone-Shaped or Oval, of smaller sizes than are represented or numbered herein. Although more than ordinarily expensive to make, **we keep the price the same as for ordinary Cavity Burs.** In sending orders, please specify the shape desired, as for example: "One Dozen Round Minim Burs."

SPECIAL OFFER.

A discount from list prices of ten (10) per cent. will be given on all cash orders for Engine Instruments which amount to twenty-five dollars or upwards.

PRICES OF ENGINE EQUIPMENTS.

Plug Finishing Burs	$6 00	per doz.		50	cts. each
Extra Size Finishing Burs	7 20	"		60	"
Stoned Finishing Burs	12 00	"	1	00	"
Extra Sizes proportional prices.					
Excavating or Cavity Burs	3 00	"		25	"
Extra Sizes	4 20	"		35	"
Stoned Excavating or Cavity Burs	6 00	"		50	"
Stoned Excavating or Cavity Burs, Extra Sizes proportional prices.					
Minim or very Small Burs, Round, Bud, Wheel, or Cone shaped	3 00	"		25	"
Right Angle Cavity Burs and Drills	3 00	"		25	"
Trephines				75	"
Screw Mandrels, with Collar	3 00	"		25	"
Screw Mandrels, blanks (no collar), for Mounting Wooden Wheels, Leathers, &c	1 50	"		13	"
Large Knife Edge Wheel Burs			1	25	"
Plate Saws			1	00	"
Burnishers, Corrugated	9 00	"		75	"
Burnishers, Smooth	6 00	"		50	"
Parting Nut Mandrels, Nickel Plated	4 80	"		40	"
Parting Nut Mandrels, plain	3 60	"		30	"
Drills of all forms and sizes (except Nerve Drills)	3 00	"		25	"
Nerve Instruments	4 80	"		40	"
Leathers, Mounted	3 00	"		25	"
Leathers, not Mounted	1 00	"		10	"
Bands for Engine, Morrison	1 20	"		10	"
Bands for Engine, Suspension	1 80	"		15	"
Ive's Tongue and Cheek Protectors (2 sizes), to be used with disks, wheels, &c	per set, 1 50			75	"
Right Angle Attachments			5	00	"
Arkansas Stones, Mounted	12 00	"	1	00	"
Hindostan " "	6 00	"		50	"
Scotch " "	3 60	"		30	"
Corundum Points, Mounted	1 50	"		13	"
Corundum Points, not Mounted	75	"		7	"
Rubber Disks, hard or soft	1 20	"			
Twist Drills	4 80	"		40	"
Boxwood Disks (3 sizes, see cut)	1 00	"		10	"
Wood Socket or Port Polisher, plain				25	"
Wood Socket or Port Polisher plated				35	"
Wood Socket or Port Polisher, Screw Socket				35	"
Corundum Wheel, No. 13, $\frac{7}{16}$ in. diameter	1 50	per doz.		13	"
Soft Rubber Points, shape of Corundum Points			75	cts.	per doz.
Wood Polishing Points			$1	25	per Box.

We are prepared to furnish any of the instruments illustrated in this pamphlet, adapted to either the A, B, or C style Hand Piece. The C style Instruments also fits the S. S. White Engine, and Cone Journaled Hand Piece.

In ordering instruments, designate them by the numbers, and state whether they are wanted to fit the (A,) (B,) or (C) hand piece. Each bur is numbered on its shank.

Style A.

Style B.

Patented Sept. 10, 1872.

Style C.

Patented Feb. 24, 1874.

NOTE.—To fasten Burs in the Hand Piece, it is well to push back the catch-spring with the left hand while inserting the Bur with the right hand.

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1877–78.

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The regular course of Lectures will commence on Tuesday, October 2d, and continue until the latter part of February. Three hours of each day of the week (except Saturday) will be devoted to Lectures, and four hours to *Clinics*, and practice at the Chair and in the Laboratory, under the direction of the Demonstrators.

Our Infirmary is furnished with twenty-four good chairs and all the appliances. Our Lecture-room will seat, and our Laboratory accommodate, two hundred students; all on one floor, and up one flight of stairs only. There is seldom any lack of patients for students to operate upon.

Tickets for one year's Instruction, including Course of Lectures, Matriculation, Demonstrators', Diploma Fees, and practice in the Infirmary the seven and one-half months between the sessions...	**$150.00**
For the Course of Lectures only	**100.00**
Matriculation	**5.00**
Graduation Fees	**30.00**

Board may be obtained for from $6 to $8 per week.

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12 West Nineteenth Street, New York.

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Nos. 108 and 110 N. Tenth Street, above Arch.

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D. D. SMITH, D.D.S., Professor of Mechanical Dentistry and Metallurgy.
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T. C. STELLWAGEN, M.D., D.D.S., Prof. of Dental Pathology and Op. Dentistry.
EDWARD L. HEWITT, D.D.S., Demonstrator of Operative Dentistry.
ALONZO BOICE, D.D.S., Demonstrator of Mechanical Dentistry.
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Spring Course of Lectures will commence on the first Monday of April, and continue until the last of June. *Fall Preliminary Lectures*, commencing Monday, September 4th, will continue daily until November. Like the Spring Course, their object will be to anticipate subjects presented during the Winter Session. *The Regular Winter Course* commences Monday, November 6th, and closes on the last day of February ensuing. Three hours of each day will be devoted to attendance upon lectures, which will be illustrated to the fullest extent by a large and valuable collection of Chemical and Philosophical apparatus, and Anatomical and Pathological specimens. Tickets for the Course, including the Demonstrators', $100; Diploma, $30; Matriculation (paid but once), $5. For further particulars address

J. H. McQUILLEN, Dean, S. W. Cor. 21st and Arch Sts.

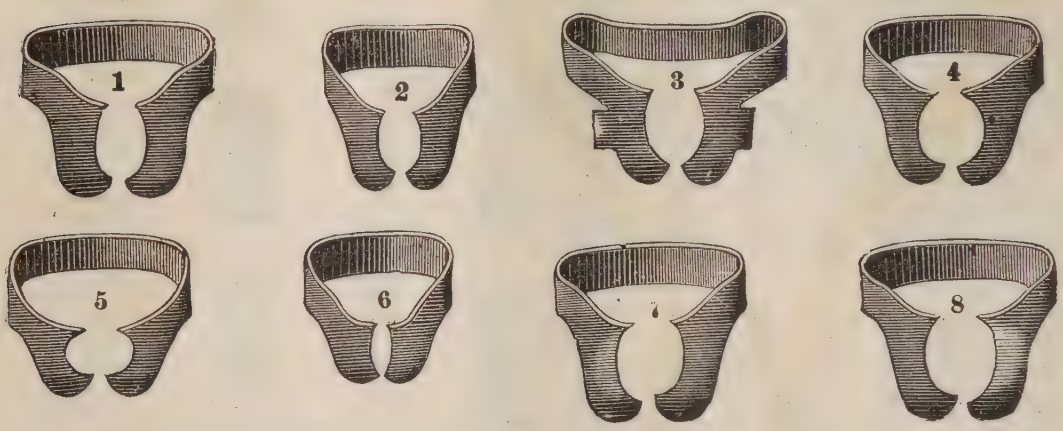
We were never more sure of doing signal service to the Dental Profession than now in offering the

IMPROVED

Rubber Dam Clamps,

INVENTION OF

DR. DELOS PALMER, OF NEW YORK.



Price, set of Eight, { Oil finish, $4.00. Nickel plated, 4.80. } Each plain, 50 Cents " Nickeled, 60

For use with Rubber Dam Clamp Forceps.

These Clamps are designed to be placed on the tooth at the commencement of the operation. Afterwards apply the Rubber Dam by passing it over both tooth and clamp.

DESCRIPTION.

Nos. 1 and 2.—Universal Clamp for Molars.

No. 3.—For posterior cavities in molars standing alone.

No. 4.—For third molars, or any molar of a cone shape. This Clamp can oftentimes be turned around while on the tooth, so as to place the bow of the Clamp out of the way of the operator.

No. 5.—For biscuspids.

No. 6.—For lateral and central incisors.

Nos. 7 and 8.—RIGHTS AND LEFTS.—For cavities under the gum, on the buccal or lingual surface of molars.

Cuts of two favorite styles of Rubber Dam Clamp Forceps will be found on another page.

These Clamps have prominent points of marked superiority over those of other manufacturers.

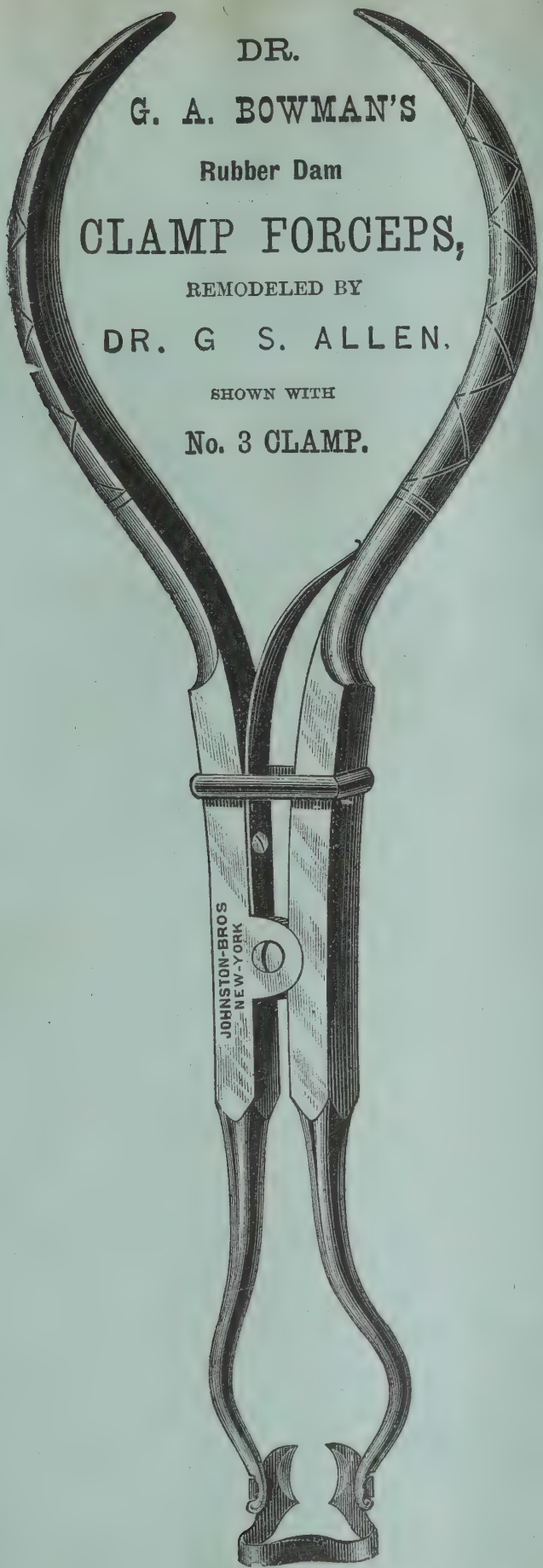
First. Each has been carefully adapted to the shape of the tooth for which it is designed, *under the personal supervision of Dr. Delos Palmer*, the inventor.

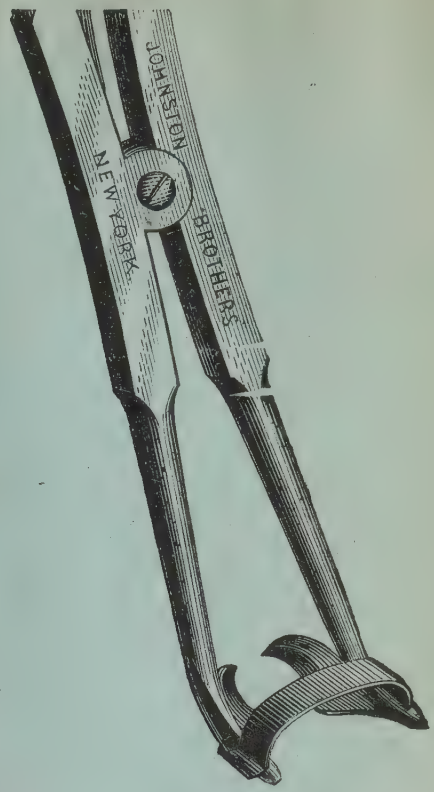
Second. A groove is made by us in the clamp, into which the forceps nicely fit, so that the clamps firmly hold their position on the forceps, when once adjusted, instead of tilting from one position to another—as is the case when no groove is provided.

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.

RUBBER DAM CLAMP FORCEPS.

Of these we offer two styles, both deservedly popular.





POINTS OF DR. T. C. ROYCE'S

Rubber Dam Clamp Forceps,

Shown with Clamp. Handles are exactly like the other style, (Bowman's.)

Both styles of these Forceps have points accurately adapted to the shape of the clamp at the neck, and hence will be found much more convenient than those hitherto offered the profession in this point of adaptation. (See also advertisement of Clamps.)

If so ordered we can supply either style of Forceps with a band, which will keep the Forceps and Clamp extended and ready for use when the hand of the operator is removed, as shown on the Bowman Forceps.

PRICES.

Forceps, either style	$3.00
" " " Nickel Plated	3.50
Complete set of Clamps, embracing eight forms	4.00
Complete set of Clamps, embracing eight forms, plated	4.80
Clamps, each	50
" plated	60

JOHNSTON BROS.
Broadway, cor. 32d St., N. Y.

1878.

JOHNSTONS'

Dental Miscellany

A MONTHLY JOURNAL

OF

AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL AND MECHANICAL LITERATURE.

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It will contain Prize Essays upon the important improvements of the day.

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The commendation of the Miscellany, received during the last year, has gratified its publishers greatly. They purpose to make the volume for 1878 superior in all respects to either volume that has preceded it. This will be—

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Or Colored Plate of Fifth Pair of Nerves,

Or Steel Plate of Evangeline,

Or Clapp's Saw Frame and two dozen Saws.

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VOL. 5. No 51.

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MARCH, 1878.

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We invite contributions of practical articles from practical men.

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supply all goods of our manufacture, as Chairs, Brackets, Engines, Gas and Gas Apparatus, etc., as well as all other Dental Supplies, at same rates as obtain with us.

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JOHNSTON BROS., 1260 Broadway, N. Y.

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ORIGINAL CARIES.

Read before the Massachusetts Dental Society by Prof. T. H. CHANDLER.

The dentist of to-day, in his zeal for operative dentistry, and the controversies between soft and cohesive gold, mallet and hand-work, pellets and cylinders, amalgams and oxychlorides, electric and galvanic forces, and all the other multitudinous questions pertaining to the repair of carious teeth, and the prevention by mechanical means of further caries, seems to have lost sight of the preliminary questions: What is the cause of, and how shall we prevent original caries? Now and then the latter comes to view in theories about our food, insufficient phosphate, mal-nutrition, producing a faulty constitution of the tooth, hereditary predisposition, handed down from our great ancestor, Adam, and all his descendants to the present day, tormenting us as punishment for *their* sins. "The fathers eat sour grapes and the children's teeth are set on edge." Or, leaving the hereditary causes, mechanical ones are called to view—crowding and overlapping of the teeth, improper and deformed articulation, pressure from behind, as each successive molar takes its place, too great friction with stiff brushes, abrasion with improper tooth powders, etc. To cure the caries caused in these various ways, no means are proposed but the mechanical ones of extraction to relieve crowding, filing, or grinding,

or cutting away superficial caries, and filling with one or another material the caries of a deeper kind.

Aside from the causes spoken of there are others which have been investigated, and which lie behind all these. Mere pressure and crowding would not *cause* caries, neither would hereditary predisposition, nor malnutrition, nor the fall of Adam. They can simply occasion—simply place the teeth in such a state or condition that the caries itself, a thing distinct from any one of them, may find a lodgment.

What is caries? has been asked and investigated by many authors. Whether it is internal or external, or both, has also been mooted; and it would seem that sufficient light had been thrown upon the subject to enable us to form and to act upon an opinion as to its cause and prevention. The latest authors who have investigated the matter with any degree of thoroughness, experimentally and with the miscroscope, are Magitot and Leber and Rottenstein. Wedl has gone into the matter, apparently without original investigation by experiment, confining his work to the microscopical examination of sections, and the compiling and criticism of the researches of his predecessors. The results of these investigations and inquiries point strictly in one direction—namely, the chemical action of acids in the mouth or upon the lime-salts contained in the tissues of the teeth. Leber and Rottenstein go still further, and attribute the rapid increase of caries, after the exposure of any portion of the dentine, to the proliferation of the fungus leptothrix in the dentinal tubuli, while even they assert that this exposure must be originally made by an injury to the tooth, accidental or congenital, or to the direct action of an acid, dissolving away the enamel covering. Whether this acid comes from fermenting and acidifying saliva and mucus, always present even in the most healthy mouth, or from the decaying particles of alimentary substances introduced into the mouth and left in contact with the substance of the tooth upon any of its surfaces, is not material to the result. The action is that of an acid upon a base, from whatever source the acid may arise. These acids are always weak, except when introduced medicinally, as in chloride of iron and the like, and demand time for their action. Of course, this time is shortened or lengthened by the natural quality of the tooth, whether of a dense and flint-like substance, or soft and porous, and full of congenital fissures and defects; also by the state of health of the subject, causing a greater or less intensity of the acidity of the secretions. But in any case time is an important element in the conditions.

If this statement of the facts is true—if chemical action is the great

destroyer of teeth—not the only one, perhaps, but that which does it in the great majority of cases—it would seem that this fact of itself would give the hint to the proper prophylactic treatment of the malady. The opposite of an acid is an alkali, and each has the property of neutralizing the action of the other. Therefore, the evident *a priori* best treatment for any disease caused by one, is to treat it with the other. If caries *is* caused by acids, it is not properly a disease in the true sense of the word, but what is technically termed a lesion, an injury, a removal of a part, or of an integral portion of substance, as truly as though it were done by a blow or by an instrument. Therefore, the use of alkalies is indicated as preventive to caries. As the acids are weak, but persistent, weak and persistent alkalies are necessary to counteract them. The use of soap with tooth powder has long been recommended, following the clue given by Dr. Bowditch, who years ago noticed the parasitic fungi of the mouth, and the fact that they were destroyed by soap. Leber and Rottenstein, while also advising the use of soap with tooth powders, also recommended permanganate of potassa, in weak solution, as an antiseptic, and as a means of preventing fermentation, that great parent of acids.

But as tooth powders and the brush are used, at the most, four times a day, and as most people are in doubt as to whether they do right or not in using them so often, or of using powders at all, I have been in the habit, latterly, of advising, in addition to the habitual brushing, the constant thorough rinsing of the mouth, particularly at night and morning, with a solution of bicarbonate of soda.

This is a weak alkali, which every one has in the house, and of which nobody is afraid. I advise holding it for some time in the mouth, forcing it through the teeth with the muscles of cheek and tongue, that all collections in the interstices may be thoroughly corrected. I have found this practice to result in checking decay in mouths where the teeth seemed to be doomed, so virulent were the secretions and so rapid the destruction. And not only so, but the sensitiveness of such teeth has been in some cases partially and in others wholly allayed, especially at their necks, which are apt to be so sensible. In *my* practice I have been aided very much in this way, and would strongly recommend a trial of it to others. It is a simple matter, and no harm will be done, if no good ; therefore, we should give our patients and ourselves the benefit of the doubt.

REPLANTING TEETH.

BY DR. GEO. S. ALLAN.

There are not many dentists, in the States, who have had much experience in replanting teeth, and, probably, put two or three can say that they ever transplanted teeth. The former has been recognized as a proper mode of procedure where, through accident or necessity, a tooth, otherwise useful, has been extracted or torn from its socket. The strong element of doubt, however, in the success of the operation has prevented its adoption in all other cases, and they have, therefore, no place in legitimate practice, and are only known as curiosities in our literature. If replanting can be made more generally useful and adapted to cases other than those alluded to, the principles that are to guide and direct us can only be formulated and made plain by a careful study of the facts already known. But even if its range of application cannot wisely be extended, a little more certain knowledge of facts and principles will greatly help where it is the all we have to depend upon.

Other things being equal, we may safely say that success in replanting depends—directly, on the time that has elapsed between the removal of the tooth from its socket and its replacement, and the general health of the patient ; and, indirectly, on the skill of the operator, the amount of damage done to the surrounding parts, etc. A healthy tooth extracted from the mouth of a healthy patient and immediately replaced, seldom fails to reunite and become useful, but the further one is forced to depart from this condition of affairs, the further he leaves the chances of success behind him. He can go so far that the tooth will be retained in place only by mechanical or semi-mechanical means, and his measure of success will be rated accordingly.

Two cases, occurring in the practice of the writer, are here given as a slight contribution to the history of the subject. In the one success was only partial, in the other more complete than could have been expected.

Daisy Walt, 14 years, in running and romping with her companions, was thrown forcibly against a post, and her front tooth knocked out of its socket and broken transversely across its crown. Some three hours after the accident her mother found the tooth, and, without giving tooth or socket any treatment, not even washing them

in warm water, put the tooth in its socket, and late in the afternoon—the accident occured early in the morning—took her daughter to a prominent dentist in the city. The advice received was to leave things as they were, and to give her daughter farinaceous and liquid foods only. One week afterwards she was brought to my office. On examination the soft parts around the tooth were found swollen and tumified, and the tooth itself quite shaky, in fact, union had hardly commenced to take place.

Thinking that there might be some foreign particles adhering to the tooth or its alveolus, a delicate instrument was carefully used to clean the neck and as far down the root of the tooth as could easily be reached. The crown of the tooth, which from lack of cleaning was covered with a thick slimy deposit, the gums and surroundings, were washed carefully with warm water and arnica (1 part of latter to 8 of former), and then ligatures were tied on to prevent movement of the tooth and to favor adhesion. This practice was kept up for three or four days, and in addition good hearty diet was recommended. On the fourth or fifth day, partly by accident and partly by design, the tooth was re-extracted. True union had hardly commenced. The tooth, the socket and adjacent parts were now carefully cleansed and the tooth again placed in position, and the treatment continued as before. Union of some sort (and whatever its nature it was sufficient to give the tooth a healthy, firm feeling to the touch), gradually took place, and in a little over two weeks more the ligatures were taken off and the patient dismissed. One year afterward the tooth was opened and the pulp (dead) removed. Some two years afterward the tooth, though firm, seemed to have receded into its socket. In four years the recession was so great as to disfigure the patient greatly and as there was an unhealthy look generally in the region of the tooth, the tooth itself was taken out and replaced by an artificial one. An examination showed that the tooth was not only dead but presented the appearance of a piece of wood that had been under water for a long time and been eaten and honey-combed by worms. It was dark colored, soft, and had from one-third to half of its substance removed. The surface of the alveolus was also in an equally bad condition, and considerable necrosed bone was removed by scrapers, and acid applications, before healthy granulations could be induced. Here, evidently, true union had never taken place. From the first the replanted tooth acted like a foreign body. It became necrosed and was the cause of like condition in the neighboring bony structure.

The other case, that of Willie L., only came into my hands long after the replanting of his tooth had taken place, and I am indebted to the kindness of his mother for its history. The case is remarkable for its complete success, and for the additional fact that the tooth replaced belonged to the temporary set. When the tooth was taken out its root was only partially absorbed, and, as will be noticed by the dates given, it remained in place a little over its right time.

"In February, 1871, when Willie was just three and a half years old, while running, fell against the bed, striking his mouth upon the castor. I did not at first perceive that the tooth was gone, but in wiping away the blood noticed its absence. On searching, I found it upon the floor unbroken and looking as if it had been wiped clean with a cloth. I laid it upon the mantel where it remained quite half an hour. It was restored to its place by a nurse, and remained there without inconvenience of any kind until it became very loose and was taken out in Massachusetts, in 1875."

Shortly after writing the above a case of Riggs' disease came into the office. A bad case, and, as usual, of long standing. One tooth, the left inf. 2d molar, the anterior bicuspids being out, was quite loose, having the gums pushed away from its neck and more or less discharge taking place constantly from the same location. Feeling assured, after a close examination, that there was more or less tarter between the roots and that it would be a difficult, if not an impossible matter, to remove it in the ordinary way, the suggestion was made to the patient, and by her accepted, of extracting the tooth, removing the tartar and then replacing it. The extraction was quickly and easily performed, and, as expected, the tartar was found in hard scales, both between the roots and far down towards their apices. It was thoroughly removed as quickly as possible. The sockets in the alveolus were thoroughly cleansed ; first, with warm water only, and then with the same slightly impregnated with carbolic acid. The tooth was then replaced, slight force only being required to press it in place. To ensure its retention and keep it from moving, a ligature of waxed silk was used in connection with a plug of gutta percha. The former was attached to the wisdom tooth back of it and to the gutta percha in front. The latter was fitted, when warm and plastic, to the space between the replanted tooth and the cuspid, and secured to the latter by a second ligature. So much being done the patient was dismissed. She was advised to use the tooth as little as possible, and apply warm water and arnica, in equal parts, every

hour or so. For a day or so the tooth continued sore and the gums tumified and swollen, then the bad symptoms gradually subsided. In a week the ligatures and gutta percha were removed; in two weeks, what might well be called a cure, had been effected. The socket of the tooth was free from pain; the gums had a healthy appearance and the tooth could be used with comfort.

What the future history of this tooth may be, of course, can only be surmised; at the present writing, however, it promises, for some time to come, to perform all its proper functions in a satisfactory manner.

If replanting can be successfully introduced as a regular method of procedure, then it would seem to be especially applicable to the trouble last noticed, viz., Tartar on or between the roots of teeth. A molar was certainly not a favorable tooth to operate on. Any of the anterior teeth would promise better results, still a fair measure of success was attained. By the methods ordinarily adopted, it is a very difficult and uncertain operation to remove all the tartar from the roots of teeth so affected; by extracting and replanting you can make a certainty of so much in any case.

THE POISONS OF THE INTELLECT.

BY CHARLES RICHET, IN "REVUE DES DEUX MONDES"—1877.

(*Translated by* PROF. THOS. H. CHANDLER, *Boston.*)

There is nothing more instructive for a knowledge of the phenomena of life than the study of the disturbances of the organic functions produced by the various poisons. In truth, the signification of this word *poison* should be greatly extended. A poison is not, as we may be led to believe by the common use of the word, a substance always mortal and deadly; on the contrary, nearly all the medicinal substances are toxic, and *vice versa.* Opium, which is an admirable medicine, is at the same time a redoubtable poison. Alcohol, which, taken in small quantities, is a salutary stimulant to the digestive organs, in a large dose causes grave disorders, often leading even to death; therefore we should be seriously embarrassed if we endeavored to separate the class of medicaments from that of the poisons. M. Claude Bernard defines a poison

as a substance which cannot enter into the composition of the blood, nor in any way penetrate the organism without causing therein either temporary or permanent disturbances. Here we have a clear and formal definition which will enable us to distinguish a poison from an aliment.

An aliment is an assimilable substance, which, at a given moment, may become a part of our blood or of our tissues ; a poison, on the other hand, must be eliminated and disappear, for, if it exists in the blood, it is only accidentally. An egg is an aliment, because the substances of which it is composed will be absorbed to pass finally into the circulatory torrent ; but if we give a sick person a grain of emetic we shall have given a poison, because the emetic will be necessarily eliminated, and the organism cannot support its presence in the blood. The action of the emetic as a medicament is in no sense different from its action as a poison ; it is simply a poison in a small dose. Therefore the distinction between a poison and a medicine is artificial, and should be absolutely banished from scientific language.

The study of the poisons is, then, as useful to the physician as to the physiologist. To the physician who wishes to cure the organs that perform their functions badly, it shows the action of the substances he may employ, so that toxicology, or the science of poisons, is nothing other than experimental therapeutics. Formerly, in the time of Orfila, experiments upon poisons were intended only to elucidate the more delicate problems of legal medicine ; now-a-days they relate to the whole body of medicine. As M. Claude Bernard has likewise said, a healthy organ and a sick one do not function differently, and the action of a poison upon the sound organism may become a medicinal action upon an organism diseased.

A great progress was made the day it was first sought to limit the rôle of the poisons to a single organ or tissue. To us of to-day this seems an elementary idea, and that nothing was more simple than to inquire if one or another substance acted more specially upon the blood, or on the muscles, or on the brain ; but this inquiry, which appears to be the first step in toxicology, dates back no further than a score of years, and it may almost be said that the excellent investigations of M. Claude Bernard upon *curare* were the point of departure. Before him, in place of analyzing the functions of the organs, or of the tissues, they were regarded as a whole. In all physiologic phenomena the result of a special force was sought, acting upon the organs, and all the properties of these organs were called vital properties. Now-a-days, who still

thinks of upholding these doctrines? The vital principle is not unique, it is disseminated among all the living parts, and no one would wish to resuscitate the theories of the ancient school of Montpellier, which asserted the existence of a vital force presiding over the organic functions. A living being is one composed of living organs which may die separately. These organs are composed in turn of tissues; these tissues are built up of cellules, and all these parts may disappear successively without the end of one necessarily causing the death of the others.

Let us take an example which will elucidate this proposition. The combustion of charcoal in confined air produces a toxic gas, the oxide of carbon, or carbonic oxide. This it is that takes the life of those unfortunates who commit suicide by burning charcoal in an hermetically-sealed chamber. Now, carbonic oxide acts specially upon a particular element of the organism, viz.: upon the red globules of the blood, and all the symptoms of death by carbonic oxide are the consequence of this poisoning of the blood. This means that the blood dies before the other tissues, and, if these also die, it signifies solely that they have been deprived of living blood, which is indispensable to their own existence. Also, death by hemorrhage presents the same phenomena as does that by carbonic oxide, and it is possible in both cases to bring back all the appearances of life to the poisoned animal by restoring to his organism in the former case the lost blood, and in the latter that which has become unfit for supporting life. Physiologic analysis has gone even a step further; not only has the fact been recognized that the blood has been poisoned, but even the portion of it affected has been determined; it has been seen that it was the red globules of the blood, and in these globules the substance called by chemists haemoglobine, which takes the oxygen from the air to carry it to the tissues. It certainly could be wished that we had as precise a knowledge of all the poisons as we have of carbonic oxide. Unfortunately this is far from being the case. We know that the muscles, the blood, the nerves, the spinal cord have properties which are destroyed or perverted by certain special poisons, but our knowledge rarely goes beyond this primary localization. I am about to study in this memoir the poisons that act upon a certain part of the organism, one of the most noble, indeed, as it is the organ of the intelligence—the brain. But I shall not endeavor to point out the exact spot where this poisoning takes places. The seat of the intellectual functions is not sufficiently well determined to enable us to investigate anything more than the symptoms. We shall then see what are the symptoms of

poisoning of the intellect: perhaps this investigation may be found as profitable for philosophers as for physiologists, the union of the physical and the moral being so close that to separate the study of them can bring nothing but inconvenience.

This introduction was necessary to make it understood what we comprehended by the term *poison of the intellect.* We do not wish by this to be understood to say that a poison acts solely upon the intellect without affecting, in a greater or less degree, the other organs and the other functions. We mean only that its first action is upon the intellect; that, if later the other functions are disturbed, this changes in no respect its property of acting at the outset upon the intellectual faculties. It is, therefore, not an exclusive action, but only a predominating one, for there can be no absolute classification for physiologic facts, and every rigorous demarkation is necessarily arbitrary and mixed with error. Thus, to keep to our example already cited, at the last period of poisoning by carbonic oxide, there is intellectual agitation, delirium and other symptoms of perversion of the intelligence; but these disturbances come only consecutively, and are the result of the complete poisoning of the blood. The brain deprived of living blood is troubled in its function, just as delirium is observed in cerebral anaemia following upon great hemorrhages, so, following poisoning by carbonic oxide, we see intellectual disturbance produced by absence of a living and oxygenated blood. So oxide of carbon is not a poison of the intelligence, it is a poison of the blood which acts upon the brain only because it has already acted upon the blood. On the other hand, there are certain substances that disturb primarily the functions of the brain, alcohol and chloroform for example. Before troubles arise elsewhere of any function whatsoever, the intelligence is attacked—the intelligence or the sensibility, which is the same thing. There is no disturbance of the functions of the muscles, or of the blood, or of the heart, or of the lungs, but there is a toxic action upon the intellectual faculties, an action betrayed by drunkenness and delirium. It is true that later, if the intoxication is pushed farther, the heart, the stomach, the muscles end by reflecting the perversion of the nerve centres, but these troubles are only secondary, and alcohol, chloroform, ether, hasheesh, opium and coffee are veritable intellectual poisons.

Moreover we should not be surprised to see that poisons which at first affect the intelligence end by carrying their action over on to the other functions. In fact, the central nervous system, the organ tainted

by the poison, governs nearly all the great vital functions, and just as it is the organ of the intelligence, so is it the organ which excites the muscular movements and governs the functions of the heart, of the alimentary canal, and of the secretory glands dispersed throughout the organism. Also, among the poisons of the central nervous system, there are some that act on some special function rather than on others, and, nevertheless, at the last period of their action, all these functions end by being profoundly disturbed. Thus chloroform, which acts at the outset by suppressing the will, memory and feeling, that is to say, affecting the functions of the brain, ends by paralyzing later the movements of the heart and of the respiration, that is the spinal cord, whilst strychnine acts in the reverse direction, first on the spinal cord and afterwards on the brain. Also an emetic acts upon the stomach only through the intermediation of the nervous system. If the nerves connecting the spinal cord with the stomach are cut, the vomitings consecutive upon poisoning by the emetic are hindered, and, nevertheless, the emetic leaves the intelligence intact, at least when it is given in a small dose, for in a stronger dose its first action is upon the heart and subsequently upon the intelligence.

Thus there exist poisons of the central nervous system which act upon different parts of this tissue, and if we ascribe to the nervous system three principal functions, the intelligence which depends upon the brain, the voluntary movements which depend upon the spinal cord, the organic movements of the heart, of the alimentary canal and of the glands, which depend upon the rachidian bulb, intermediate between the spinal cord and the brain, we shall have poisons acting primarily upon one or other of these parts, and consequently upon the functions depending upon them, but carrying their action later to all the parts of the nervous system. We shall consider here only the poisons acting at first on the brain and disturbing the intellectual functions. We shall not seek to ascertain why they act in this manner, for their mode of action is still unknown. It is certain that the poison is borne to the brain by the blood, and that the intimate action of the blood charged with toxic matter upon the nervous cellules of the convolutions modifies them in a way to disturb the mind; but what is this action? Is it a chemical combination of the poison with the cellules? Is it a mechanical disturbance of the cerebral circulation? We are as yet in utter ignorance of these matters, and it remains for future experimentation to one day declare them to us. Nevertheless, before knowing the *wherefore* of

things, it is easy to know the *how*, and if we do not know the final cause of the poisonings of the brain, we can at least study their results and their symptoms.

II.

The study of the poisons that act on the intellectual faculties presents not only a physiologic and psychologic interest, it has also a considerable social interest. It seems, indeed, that man, in all ages and in every country, has been dissatisfied with the state of his intelligence, and that he has sought to excite it by means of toxic substances. Now, the characteristic of all the poisons of the nervous system is that the poison, before destroying it, over excites it, and it is this excitement that man seeks with eagerness, with passion. Once become a habit it fastens itself with such force that nothing can thereafter shake it off. It is a true social peril as well for the Chinese and Hindoos who smoke opium, as for the Europeans who drink alcohol.

Alcohol is, as everyone knows, the product of the fermentation of sugar. All the sugary liquids left to themselves ferment, giving off alcohol and carbonic acid ; also all the fermented sweet liquors are alcoholic drinks. In fine, the symptoms which these drinks produce are always almost exactly the same. Although these symptoms have been known for a long time they have rarely been the objects of methodical analysis, and perhaps only in the scattered observations of novelists or dramatists can be found ingenious and shrewd remarks upon drunkenness and its effcets.

The first effect of intoxication by alcohol is an intimate feeling of satisfaction, a kind of beatitude which is very agreeable. At this moment the ideas seem to brighten, all difficulties and obstacles disappear ; to use a common expression, life seems rosy, and we are happy in the mere thought of living. If we continue to drink, the intellectual excitement continues and is manifested in many ways ; all these forms may be summed in one word as *hyperideation.*

The hyperideation of drunkenness of the first degree is a very curious and interesting phenomenon, but the observation of it upon one's self too often would be dangerous. In this state there is a profusion of ideas of every kind, joyous, glorious, libertine, sad, warlike, which follow each other with exceeding rapidity. What especially characterizes them is that they are not moderate ; it seems as if there were a larger measure of the intelligence ; everything is out of proportion and everything is

magnified. The moral forces are felt to be ten-fold greater ; we believe ourselves able to do everything and to undertake everything, and yet new ideas follow one another without cessation ; after one undertaking another is thought of, and then still another and another. All are impracticable, but they smile upon us as they pass ; perhaps among the number there are some that are sensible, but we have no time to stop ; there is a perpetual round, a sort of phantasmagoria of a more or less seducing kind, in which we can find no opportunity for a pause. It may easily be understood that in this condition there is no power of keeping one's secrets ; we become communicative and affectionate. Even when the intoxication is slight this need of expansion already manifests itself ; but at one degree more advanced there is no confidence which resists. "As boiling sends to the surface all there is at the bottom, so wine makes those who have taken it immoderately divulge their innermost secrets." This hyperideation is nothing more than an excess of the imagination, and this activity of the "*fool of the house*" is often shown in another manner, by ingenious witticisms, pleasant sayings, eccentric freaks. Some authors, it would seem, cannot compose except when in this condition of surexcitation, and this has given to their works a certain factitious stamp of originality. Frequently, in intoxication, in the midst of this deluge of ideas, there suddenly appears one, with no apparent association whence its origin may be guessed—an idea with no apparent connection with any preceding, but which fastens itself with desperate firmness. In the midst of the others it is constantly recurring, just as in a piece of music the theme incessantly reappears amongst the modulations and variations that surround it.

Thus we notice two special characteristics at the beginning of drunkenness ; on the one hand the rapid succession, on the other the fixity of ideas. At first thought, it seems as though there were a contradiction between these two different forms of intellectual excitation. Nevertheless, if we carefully examine the mechanism of the intelligence, we shall see there is no discord.

In the normal state, all the faculties, the imagination, the judgment, the memory, the association of ideas, are regulated by another superior faculty, viz., the attention. The attention, or the will, is the man himself ; it is the *ego*, which, being in full possession of the resources of which it disposes, takes them where it will, when it will, to do whatsoever it pleases. Now in drunkenness, even at the very beginning, the will and the attention have disappeared. Nothing is left but the imagina-

tion and the memory, which, left to themselves, without regulation and without guides, produce the most unexpected effects. Sometimes it is an idea which cannot be driven away, sometimes one which cannot be held, for the attention is meant as well to eliminate some ideas as to fix others. The fixed idea, therefore, comes as much from want of attention as the one that is too fleeting, and in both cases it is consequent upon the poisoning of the brain by the blood loaded with alcohol. Also, although it seems to him who has reached the first grade of tipsyness that his power of work is increased, if he really wishes to work he will soon find himself unable to collect and to fix his ideas, and the deceptive fecundity with which he thought himself endowed very quickly appears as a real impotence, against which he cannot strive. Yet sometimes, by chance, or the effect of habit, the fixed involuntary idea is precisely that which he wishes to develop, and this lucky coincidence may cause him to believe that his attention is intact; but this will be found only an illusion, for it will be impossible for him to perform any other work. The loss of attention, therefore, the superexcitation of the imagination, and the diminution of judgment, are the characteristics of the first steps of drunkenness. It is interesting to see how the poets and romancers have painted this period of poisoning by alcohol. The Uncle Van Bück, in a proverb of Musset's, Tholomyès, and Grantaire, in *Les Miserables*, hold queer discourse, and not unlike the oddities of drunkards. We can get no better idea of drunkenness than by reading their conversation. It is life caught in the act, and one example is worth much more than any theory. Thus, Fantasio, in a spree, gives utterance to a thousand nonsensical sayings :

"SPARK—You are getting drunk——

FANTASIO—That's just it. I'm getting drunk.

SPARK—It is a little late for that.

FANTASIO—What do you call late? Noon, is that late? Midnight, is that early? Where do you begin your day? Stop there, Spark, I beg of you. Let's drink, talk, analyse, rave, talk politics, imagine combinations of government, catch all the mosquitos flying around that candle and pocket them. Do you know that steam guns are splendid things in the way of philanthropy? There was once a King who was very wise, very wise, very happy, very happy—— Look here, Spark, I am drunk. I must do something. Tra la! tra la! Come, let's be off!"

This flood of ideas, this fictitious exuberance of vitality of intellect,

has often tempted poets, and not infrequently they have succeeded to a marvel in translating into poetic language the visions of intoxication. Read, for example, the sparkling verses which Emile Augier, in the *Adventuress*, puts in the mouth of Don Hannibal, whom Fabrice tries to get tipsy to surprise the secret of Clorinde, the sister of Hannibal :

> " The more I drink, by heavens ! the thirstier I grow.
> Look at this juice, my Abbe, this ruddy juice divine;
> This that the vulgar world most modestly calls wine.
> 'Tis this consoles in sorrow, 'tis this brings every joy.
> Along with this come pleasure and all good times, my boy !
> To hell with cares, with terrors, with constant dread of wrongs.
> Whene'r I take good liquor I seem to swallow songs.
> Pour out another couplet, and let the thunder roar.
> Let's drink our fill and sing our fill, as down the wine we pour."

Novelists have also well understood that the form of drunkenness is not always the same, and that it differs in different individuals. There are men whom it is impossible to make tipsy. At last, after drinking a great amount of alcohol, they will have the symptoms of profound intoxication, the uncertainty of gait, the invincible sleep, the insensibility, the vomiting, the syncope; but they will not have had, in appearance, at least, the period of intellectual excitation which characterizes the first periods of intoxication. This is because of a strange phenomenon, due to the influence of the will. We have said that in drunkenness the will and the attention have diminished, but they have not entirely ceased, so that what is left may concentrate itself upon the fear of drunkenness. Thanks to this fixed idea, whose intensity is exaggerated by the drunkenness, there are no external manifestations of the delirium. Nevertheless, within ourselves we perceive the physiologic effects of alcohol, but we retain still a large measure of power of arresting its invasion. Bad news, a severe accident, sober suddenly, if the intoxication is not too profound. There is a very curious mixture of power and of impotence of the will. The will will not hinder the vertigo, nor the internal illusions, nor the difficulties of walking straight, but it will often have sufficient strength to check the flow of words, which most often is the principal sign of the intoxication. It seems as though there were a difference between ideas and words. However incapacitated one may be to restrain his thoughts, he may be sufficiently master of himself to control his words and acts. A thought of wildest delirium may appear in spite of us and force itself upon our attention; but, by good fortune, we remain judges of this idea, and, if it seems to us delirious, we have strength to keep silence, and not let it be seen what is passing within.

But if, on the contrary, one gives up to the first approaches of intoxication, if one abandons his will, uttering aloud whatever foolish thoughts pass across the intellect, then there can be no further pause unless some serious event occurs to put an end to the hyperideation and the torrent of words.

This is peculiar to those who consent to intoxication. They say at the beginning of a feast that they shall let themselves go, and from the very first cups they are drunk. Sometimes even the intention of becoming intoxicated is equivalent to the fact. There are seen people who become intoxicated before drinking—stupefied by their very thoughts. Language has adopted this analogy. Good news, an unexpected fortune, unhoped for success, produce an effect analogous to intoxication, and it is said "he is drunken with success."

In a scene of *The Contagion*, d'Estrigaud offers to André Lagarde a considerable fortune, a sum of three millions, on condition of an infamous bargain. André resists for a while, but ends by accepting. He renounces poverty; he prefers luxury and pleasure. "It is the aloe's flower that blossoms. Long enough have I lived shut up in my shell. Air! by George; racket! especially a row at night! Let's throw away the marks of the plebeian and thrash the watchman! Lucien—He is drunk, I really believe! D'Estrigaud (aside)—Yes, I have set him up!"

There is, therefore, side by side with the intoxication of alcohol, a sort of moral intoxication resembling it, and made manifest by the same effects; but this latter is very rarely observed, and it is not every one that has the power of feeling it.

Recurrent Naso-Pharyngeal Polypus—Removal by Galvano-Cautery, (Service of Dr. H. B. Sands,) May 17, 1876.—W. H. A., aet. 15. In December, 1875, Dr. S., exsected the superior maxilla and removed with the galvano-cautery, a tumor about the size of a hickory nut, which was attached to the basilar process of the occipital bone; and the patient left hospital apparently cured. Latterly the symptoms have returned, and upon examination a tumor about two inches long, and having a granulation appearance, was discovered on the seat of the old trouble, extending forwards to the great wing of the sphenoid, and downwards to the level of the hard palate. The patient was etherized, the lateral attachments divided by the galvano-caustic knife, the tumor drawn up and its pedicle divided with a straight probe-pointed bistoury. The remainder was removed with mouse-tooth forceps and scissors. The hemorrhage was moderate and easily controlled by pressure and ice. On May 25, the patient left the hospital cured.

A REGULAR QUARTERLY MEETING OF THE SECOND DISTRICT (N. Y.), DENTAL SOCIETY WAS HELD AT THE RESIDENCE OF DR. C. H. BIDDLE, BROOKLYN, JAN. 10, 1878, THE PRESIDENT, DR. C. D. COOK, IN THE CHAIR.

Afternoon Session.

Incidents of Office Practice.

Dr. A. N. Chapman; A right superior first molar, which had a severe alveolar abscess, was extracted, and there seemed to be the usual recovery.

After some years, there was an inflammation of the antrum, and a slight discharge from an opening through the socket of one of the buccal roots. On examination, I could find no traces of dead or diseased bone. The patient is in rather an ænemic condition, and I have advised a course of tonic treatment. I injected salt and water into the antrum twice, and then used a solution of chloride of zinc, about six grains to the ounce, which caused a little pain. Since that I have given it three dressings.

Dr. John Scott: Nothing will work in that case equal to aromatic sulphuric acid. It will cure it in six weeks.

Dr. O. E. Hill: I should have been afraid to use the chloride of zinc, as it sometimes causes intense suffering. I should prefer salt and water, or dilute wine of opium. I believe, in such cases, we should be very sure that the remedies we use are not sufficiently strong to excite severe inflammation.

Dr. M. L. Thompson: Inject a solution of carbolic acid, about half a drachm to a pint of salt and water. It will cause no inflammation, not as much as plain salt and water, and, I think, after a few applications, the patient will find relief. I don't see why she could not do it as well herself, as to go to the dentist every morning.

Dr. A. N. Chapman: The peculiarity of this case is its long standing, and I want to get the ideas of the gentlemen in regard to the proper treatment. In cases of recent date, I believe that by perforating the antrum, 99 out of 100 will get well without further treatment.

Dr. C. D. Cook: What does Dr. Chapman imagine the condition of the lining membrane of that cavity to be, and what does he propose to effect?

Dr. A. N. Chapman: I propose to keep the membrane as clean as possible, allowing no discharge to accumulate, and I hope to excite a little healthy action. If I can succeed in doing that, I shall use palliative treatment. That is about my present idea. I believe this case should be cured. There is a constant dripping from the opening, which the patient swallows; and, if there is any truth in homeopathic treatment, there you have it. The question was asked me, if it was not best to let it alone. I think not.

Dr. C. D. Cook: Have you prescribed any constitutional treatment, or is anything being done to tone up the general system?

Dr. A. N. Chapman: I requested her to go to her physician for treatment, explaining why she should, and I think she informed me that she would do so.

Dr. C. D. Cook: Why would you not treat her constitutionally yourself?

Dr. A. N. Chapman: I should not feel myself at liberty to do so, without consulting her physician.

Dr. C. F. Graves: I had a case where I extracted a tooth, and found an opening through the socket of the palatal root into the antrum, and a discharge from the nostril of that side. Just after extraction, I syringed out with lukewarm water. When I saw it again, I syringed with salt and water, and then used a dilute solution of aromatic sulphuric acid. I injected that four times, and it is healing nicely, the discharge from the nose having stopped.

Dr. G. W. Brush: I would like to make a statement of a case I had several years ago. The patient spoke of the trouble she had had for four or five years with a discharge from the nose. She supposed she had a severe form of catarrh, and was so much reduced that her friends said she was "going into a decline." On examining the teeth on the left side of the mouth, I noticed that over the second bicuspid there were traces of an old abscess. I took out the tooth, and found an opening into the antrum, and came to the conclusion that unless there was necrosed bone (of which I could find none), nature would take care of the case, if the irritating cause was removed. The next time I saw the patient it was all right. I mention this as one of those cases that amy be mistaken by physicians for catarrh.

Dr. G. A. Mills.—The case mentioned by Dr. Chapman is a very plain one, if stated right. In the first place, the patient, is in an ænemic condition, and the discharge indicates a low order of inflammation. In regard to the *method* of treatment, I do not think it makes so much difference. The remedy spoken of will be effectual, as will also be chloride of zinc or aromatic sulphuric acid, used in different degrees of strength, as circumstances may indicate. Another remedy which may be new to some, is absolute alcohol. I have never used anything more favorable in its action on morbid tissue. When I find local inflammation at the neck of a tooth, very sensitive to the touch of the brush, &c., a condition which often occurs, I treat with alcohol, and the next day the patient will say it is all right. Its effect on the tissue is magical. I think, in Dr. Chapman's case, the use of alcohol would be a very excellent treatment.

If you will allow me, I will state a case which may be received with a good deal of doubt. Extreme cases of the diseased condition of the gums and sockets, which have produced an extremely debilitated condition of the system, have been described before the Brooklyn Dental Society, by Dr. Riggs. Some weeks since, I treated the diseased gums and sockets, "*a la Riggs,*" for a lady, and the result being so satisfactory, my attention was called to the extremely debilitated condition of a sister, whom the physicians had failed to benefit. Age about 47; extremely nervous; a good deal emaciated; almost entire loss of appetite; unable to retain anything on the stomach without much suffering; had been confined to the house for some time, the general remark by her friends being, that she had come home to die. On examining her mouth, I found that she wore an upper set of teeth on gold, and had thirteen natural lower teeth, which exhibited a marked case of chemical abrasion, the entire number having their crowns cut off as with a saw, but pulps all living. Gentle pressure with the thumb and finger showed pus discharging around each root. The patient being very feeble, I treated a few teeth at each sitting, until completed. Five days after commencing the treatment, she awoke in the night and said she was hungry, and took some food, which she retained without discomfort. I have just received a letter, stating that there is much joy in the family because of her rapid improvement. Her appetite is returning, and digestion improved; she is able to walk out quite a distance. I made no dressings in this case, simply recommending the use of lukewarm salt water. This case exhibited no external deposits, but was strictly one of pus-discharging sockets.

Evening Session.

Dr. O. E. Hill.—After Dr. Riggs demonstrated his method at the infirmary, several cases were treated there successfully. I remember one case in particular; the patient was dependant upon herself for her living, and had become so debilitated that she would faint in going down stairs. We treated her by simply removing the tartar as thoroughly as possible, and then using aromatic sulphuric acid, for the purpose of dissolving what might remain. It was astonishing how rapidly she improved. I had a patient who had been suffering for three years, and was so weak that she could not walk without crutches. I was surprised at the amount of pus exuding from the gums. I treated her by carefully removing the deposit from the teeth, and she absolutely recovered her strength without other treatment. By removing the cause, in such cases, we always get good results.

Dr. Wm. Jarvie, Jr.—I had a peculiar case some three weeks ago—the only case of the kind I ever saw. A gentleman, of hemorrhagic diathesis, and weak from the loss of blood, came to me about 9 o'clock in the morning, stating that his gums had been bleeding for three days. On examination, I found the upper denture complete, not a tooth having been extracted, blood oozing from the palatine margin of the socket of the right upper cuspid, and the gums having a slightly congested appearance. I found that by placing my finger on the spot, the blood was arrested, but I was for a time puzzled somewhat in determining how to fasten a compress there. I finally put a loop of waxed floss silk around the tooth, with the loop on the inside of the mouth; I then placed a piece of cotton about the size of a bean, saturated with the per-sulphate of iron, within the loop, and tied the ends tight. This held the cotton firmly on the bleeding surface and stopped the flow of blood. I gave directions to send me word at 4 o'clock, how he was getting along. At that hour he was doing nicely, but the next morning, a messenger brought word that he was again bleeding. I found him in bed and very weak; the bleeding had been arrested up to 3 o'clock in the morning; at that time, in hawking and spitting, he had disturbed the compress, and the bleeding had recommenced. I had taken with me some gutta percha, which I softened in hot water and fitted very closely about the gums and palatine surface of the cuspid and adjoining teeth, holding it firmly in place by passing two strands of waxed floss silk between the central and lateral incisors, and between the bicuspid and molar, and

tying tightly. I used no styptic whatever this time. There was no recurrence of the bleeding, and the gentleman gradually recovered his strength.

Dr. Thos. Fry: Many years ago I was called to attend a lady, lying sick from scirrhosis of the liver. I found blood oozing from around all the teeth, upper and lower. Her physician had endeavored to arrest the bleeding, without success. I worked a little persulphate of iron around each tooth, and succeeded in stopping it. The lady died about two weeks afterwards, from the disease of the liver.

Dr. C. H. Biddle: About four years ago, I inserted an amalgam filling in the buccal surface of a left lower wisdom tooth, in the mouth of a young lady. Nine months since, she came to me with the tooth aching. Having tried all external methods to cure it, without success, I finally removed the filling, and found the pulp dead. I treated the tooth, on and off, for seven months; filled it several times, but each time I was obliged to remove the filling on account of the pain. I tried all kinds of medicine, and in various ways; the tooth being perfectly comfortable when there was no filling in it. A month ago, I filled it and have not heard from it since. I would like to know what the trouble was?

Dr. James Miller: I would like to say one word touching the case of our friend, Dr. Biddle, and ask him, if, in such a case, he has ever tried simple glycerine and carbolic acid. I must say that in such cases, I have met with decided success from its use.

Dr. W. H. Atkinson: Dr. Biddle asks for an opinion respecting that case. I think it proves the wisdom of the doctrine I have advocated many times, of reducing all these chronic abscesses to primary wounds; go through the end of the root and get fresh blood to secure a coagulum there. I take it as an aphorism, (that is a primal statement), that when a root is once well filled, there are no circumstances that excuse the removal of the filling, and all who have paid any attention to the physiology and pathology of the territory, will be able to comprehend why that is so. Inflammatory action must have been present in the periodontium, to cause the uneasiness in this case, as it can only occur in living tissue. Suppose he had gone through the root and had filled to the very apex, every one knows that all the irritation that could ensue, would be in the vascular and nerve territory.

Dr. C. H. Biddle: The root of that tooth had not been filled. The pulp had died under the filling.

Dr. W. H. Atkinson: Did you fill the root the last time you filled the tooth?

Dr. C. H. Biddle: Only with cotton.

Dr. W. H. Atkinson: When we have removed all foreign matter from any portion of the body that is able to recuperate by the process of healing, we need not hesitate to use any substance required. We should not delay one, two, or five months, or days, even when there is fear of periodontitis, or even if it be present; fill immediately. If inflammation appear afterwards, go directly through to its seat and relieve irritation, and in the vast majority of cases, you will have no difficulty. I want to make this point so clear that you may carry it home with you, and I know that, if you saw it as I do, and as the facts are, it would frequently help you out of trouble. If we would study the minute anatomy, physiology and pathology of the tissues involved, we would be astonished at the amount of success that would attend our efforts.

Dr. C. H. Biddle: We often find, at the apex of the roots of the wisdom teeth, a very thick stratum of dentine—how would you go through that to get the drop of fresh blood?

Dr. W. H. Atkinson: I should never expect to get blood without invading blood territory. I know there is none in dentinal territory, and I would go through into the tissue at the end of the root, and I should use a large nerve drill to do it. The most difficult cases I have had, readily yielded by using a drill large enough.

Dr. F. Abbott: What kind of filling would Dr. Atkinson use in roots?

Dr. W. H. Atkinson: Oxychloride of zinc, in every case.

Dr. O. E. Hill: I should perhaps agree with Dr. Atkinson in his method of treating cases of that kind, when it applies to extreme cases, such as the one presented by Dr. Biddle, but I should not agree with him as a rule of practice. When you fill the root of the tooth, you shut up the inflammation there, and close the way for your remedies. Then, as you must have an outlet somewhere, you make an opening through the gum. When there is inflammation, I go through the end of the root, if I can, but I never fill that root until all inflammation is gone. In Dr. Biddle's case, I contend that when he filled the root of the tooth with cotton, he filled it with the best material he could possibly use. It is a non-conductor, a non-irritant, and you cannot get anything else to take its place. In my own mouth, I have a front tooth, the root of which has been filled with every known material, but it constantly pained me until the root was stuffed half full of cotton saturated with creosote. It has not troubled me for fifteen years. This, however, is an extreme

case, and probably he will not succeed until he goes through from the outside.

Dr. Thos. Fry: A lady came to me, two weeks ago, complaining of a right superior incisor being very sore. On examination, I found that it was just a little elongated, and had an abnormal appearance; not the cold, blue color, seen when the pulp is dead, but there seemed to be a slight red tint. I found two gold plugs in the tooth, but they were both superficial. She said they had been there a number of years, and had given no pain when they were inserted. I concluded that the pulp was certainly dying or dead; I drilled through the palatal surface into the pulp cavity, and blood and serum poured out. The lady said she was immediately restored to comfort and ease. I syringed with salt and water, and let her go. I would like to ask some gentleman what would be the further treatment in that case?

Dr. A. N Chapman: May I ask Dr. Fry if he has left the cavity open?

Dr. Thos. Fry: Yes; for about five days. I am waiting for advice, before treating it further.

Dr. F. Abbott: I have a case similar to that of Dr. Fry. It was the right superior central incisor. The tooth had been filled two years. There had been a discharge from the right nostril; the tooth was sore and slightly discolored. I drilled through from the palatal surface of the tooth into the pulp canal, and found the pulp dead. I wiped it out carefully, and filled immediately with oxychloride of zinc. I made an incision through the gum, drilled through, as nearly as I could judge, to the apex of the root, and syringed out with aromatic sulphuric acid. I only used it three times, before the discharge through the nostril was stopped, and in a few days, it took on quite a healthy appearance. After the remarks made, I have some doubt as to whether this was the right way to treat the tooth. I would like to ask the gentlemen if it was the proper method.

"Bleaching Teeth," the subject for discussion, was here taken up.

Dr. G. A. Mills: This bleaching of teeth, has come to be a very simple matter. The method I use, is to remove the discolored portion of the dentine, and then get the color by the reflection of the white cement. In the case of a central incisor, if I found the pulp dead, and it was changed in color very much, I would go through the palatal surface, making a lemon-shaped cavity. To insure against subsequent trouble, I would invariably go through the end of the root, and get

blood. After treating according to circumstances, I would fill the root with oxychloride of zinc and cotton. I would then fill the crown with white cement, to obtain the desired color. Other cases I have sometimes treated with oxalic acid, watching until the color was about right, then going on and filling with reflecting material.

Dr. O. E. Hill: Dr. Mills says he would invariably go through the end of the root. I do not agree with him. If, in treating a tooth, I find that I can go through the end of the root, I temporize with it a few days before filling. If I cannot go through, that saves me all trouble, as I believe there is a better condition there than I can ever get again. I take the chances of its being hermetically sealed. If, after opening a tooth, inflammation followed, I might go through the end of the root.

Dr. G. A. Mills: When I said invariably, I had in my mind a certain condition of the teeth. Where the pulp is dried, I would not go through the end of the root unless I found an opening.

Dr. C. F. Graves: I have recently had a case of discoloration of a tooth, in which the pulp was not dead. In excavating a cavity in the left superior central incisor, approximal surface, (for a gentleman), I found a slight tenderness, so that I did not feel justified in filling it, without first giving it treatment. I found no exposure of the pulp. I treated it with oil of cloves and morphine, covering the preparation with a pellet of cotton saturated with sanderac varnish. I made a similar application two days subsequently. He then stated that the tooth was sensitive, to the extremes of heat and cold. I continued the treatment for about ten days, or two weeks. I observed a tendency to discoloration, (evidently caused by some local irritant), ending in congestion of the pulp. I very carefully cleansed the cavity by syringing out with tepid water, when I first discovered a slight exposure of the pulp (fully alive). I covered it with a very small pellet of cotton saturated with sanderac varnish, bathing the gums, with pellitory of extra strength, to act as a counter-irritant as well as a stimulant. I am confident the desired effect was obtained by its free use, and on the following day there was less tenderness. I continued the treatment for several days; and after about the fifth application, the tooth was fully restored to its original color, and entirely free from sensitiveness. I then took a piece of stiff writing paper and formed a cap for the pulp, which I saturated with collodion, applying so that when it evaporated, the cap adhered to the tooth; after which I proceeded to fill with oxychloride of zinc. I began treatment on or about the 10th of November, and filled on the 4th of December following. I saw the tooth

on Monday of this week, and it still retains its natural color. The pulp is undoubtedly alive.

Dr. Wm. Jarvie, Jr. : My mode of operation is so nearly like that of Dr. Mills, that I hardly think it worth while to say a word. Eight or ten years ago, I experimented with oxalic acid and chlorine, but the effects upon one or two teeth, after treatment by my neighbors, led me to give up any effort to bleach teeth by the use of chemicals. Since that time, I have endeavored to restore discolored teeth by reflection. My method is to cut out all the discolored dentine, filling the cavity with oxychloride of zinc and capping over with gold. I think there is danger in using an acid. I recollect a striking case from the hands of one of our best men. A lady had had a central incisor bleached and very beautifully filled ; within a few weeks after the operation, she showed me the crown in her hand ; it startled me a little ; I did not want any such results to occur in my practice, and since then I have not attempted to bleach teeth. Years ago, I attempted to restore the color in two or three teeth, that were of a decidedly yellow tinge, but without success. I have not been successful in treating such teeth. I think we can restore or bleach when the discoloration is of the blue or black shade, except it be at the neck of the tooth, where the enamel is very thin—at that point I don't think we can restore as perfectly as in the crown of the tooth.

Dr. Jas. Miller : In my experience, I find teeth that have been bleached by the use of chemicals, do not stand as well as where the discolored dentine has been removed, and the crown cavity filled with oxychloride of zinc.

Dr. W. H. Atkinson : If I were going to bleach a tooth, I should depend upon filling the root faithfully and leaving the crown open to the air for a time, before attempting to bleach. If there were a considerable amount of discoloration, about half the thickness of the dentine should be cut away. If iron were the source of the discoloration, I should use crystals of oxalic acid wet with water, and expect to get the bleaching at one sitting. If discoloration were the result of vegetable matter, I should use chlorine, and put on the rubber dam to secure against its bad effects.

Adjourned.

REPORT OF THE MEETINGS OF THE NEW YORK ODONTOLOGICAL SOCIETY, NOV. 20 AND 21, 1877.

By a Correspondent.

Dear Mr. Editor: As the New York Odontological Society has just closed another one of its large meetings, I take occasion, while the events are still fresh in mind, to send you a brief account of the proceedings. Before doing so, however, I will recall, for the benefit of your readers, what this Society is and has been doing. That it is local, so far as habitation is concerned, I need not say; that it is general, so far as membership is concerned, will appear whenever its list of members shall be published, as it embraces the very best men in our calling, both in this country and in Europe, so far as they have become known to the Society, and have manifested their willingness to become associated with it. Of course the standard for membership is high, no associate being accepted unless he is a graduate, and has otherwise approved himself to his professional brethren. Consequently the meetings of this Society are attended by a class of Dentists seldom, if ever, brought together at any other time. The sentiment of the Society is decidedly toward a higher education, and it does not approve of any of the disreputable practices of this country which have resulted in giving diplomas to multitudes of unworthy men. It is strongly given, also, to hear both sides of a question, so that, as you may have seen, subjects often appear and are enlarged upon before the Society that are entirely disapproved of by the majority of its membership. You may imagine, therefore, that a pretty intelligent company was to be found at this meeting, at which about 150 were present, including representatives from as far west as Buffalo, as far east as Boston, and as far south as Philadelphia, and from many intermediate cities, including Hartford, New Haven, Springfield, Providence, and others; and, as has been the case heretofore, those who have not attended the other large meetings of the Society, pronounced it "marvellous," "one of the best gatherings of Dentists they ever saw," &c., &c.

I enclose you a programme of the meeting, the first session of which was held at the house of Dr. A. C. Hawes, who spread a bountiful repast after the debates of the Society had closed for the evening.

I say debates ; I should have said monologue, for the whole evening was occupied by Prof. J. Foster Flagg, of Philadelphia, in announcing to the Society and its guests his views on the subject of "Plastic Filling, for Carious Teeth," which, he contends, as you will see by what follows, are more durable, easier of insertion, less painful, and far less expensive than any other forms of filling material.

Upon taking the floor, Dr. Flagg said that he considered himself "a modern Daniel in a large-sized lion's den," or rather "a small-sized David before a big Mr. Goliath ;" and that he expected to get the better of Goliath, and at least make him a little sick.

He stated that the first article of his creed would strike the giant full in the mouth, but as he was quite used to being in the minority, he still felt happy.

Addressing himself to the audience, he said: "You can scarcely have an idea what an out-and-out heretic I am ; I am a worse one than I was twenty-two years ago, when Dr. Robert Arthur announced his views about leaving decay in the cavities of carious teeth. He was attacked by J. D. White, whose office doors at that time swung to and fro like an electric fan, while Robert Arthur had to wait for patients."

Synopsis and comments by another writer.

Dr. Flagg stated as a matter of history that the Faculty of the Pennsylvania College condemned Dr. Robert Arthur, but that Dr. Jack and himself (Flagg) alone accepted Dr. Arthur's views, that decayed dentine should be left in the cavity if the removal of it would expose the pulp. Dr. Flagg said he was induced early in his professional career to conduct a series of experiments with Townsend's amalgam, by Elisha Townsend himself.

The speaker begged that he might be tenderly handled by the gentlemen present who might "chance to differ" with him. He then proceeded in his discourse by dividing the *accepted views (!)* of modern Dentistry as follows :

1st. "*Gold* is the best thing to save teeth."

"*We*" (Dr. Flagg) "*say that, in proportion as teeth need saving,* GOLD *is the* WORST *thing to save teeth.*"

The speaker had filled teeth with gold for fifteen years, and "many of those fillings are as good now as when introduced." He put in his first 250 fillings of amalgam at the suggestion of Elisha Townsend. The second 250 fillings introduced by him were of gold. He then seems to have quit practice, for he said, "I set myself to observe,"

and that in his observations he "did not undertake to discriminate or use judgment, but took them as they came." He said he "set" for six years as a corps of observation, during which time he filled "6 per cent. of all the teeth" that came into his hands "with amalgam". Let us hope that, for the sake of the gentleman's peace of conscience, these teeth were in need of filling when presented to him. "The next year 12 per cent. with plastic fillings" (gutta percha); the next year 18 per cent., "and so on until this seventeenth year I ought to put in 102 out of every 100 of plastic filling," but said he could not accomplish that.

Dr. Flagg said he now uses "nothing but plastic material," except tin put in for experiment. He regarded gutta percha (A) No. 1, amalgam No. 2, tin No. 3.

The speaker then passed to division

2d. (This consisted of an attempted joke at the expense of Drs. Atkinson and Bonnille respectively on contour fillings and wide separations of the teeth.)

3d. "Failure in operations is mainly due to defective manipulation."

He answered this by asking, "Why don't you manipulate better?"

Dr. Flagg had tabulated the filling of many first-class operators..... "*We*" (Flagg) "say that failure is mainly due to incompatibility of filling material with tooth-bone."

(The 4th division appears to have been missed in the excitement of charge so furiously made upon the windmill.)

5th. "Dentists who are unskilled and unscrupulous fill with tin covered with gold (!), thus causing galvanic action—pulpitis, loss of pulp, abscess, and loss of tooth."

He said that Dentists who employed tin and gold together in that manner were both skillful and scrupulous; that by so doing they avoided the above evils, and thus prevented the loss of teeth.

6th. "A filling, to be good, must not leak."

"We" (Flagg) "say, a filling may be the best known for a tooth, and yet leak badly."

7th. "Gutta percha properly used is good enough for temporary fillings."

"We" (Flagg) "say that gutta percha properly used is the best filling material that we possess." Preliminary to division 8th, Dr. Flagg said, "I have obtained the admission from a few Dentists that"—

8th. "A real good gutta percha filling is better than a poor gold one," but the gentleman declared his belief that a poor gutta percha

filling is better than a gold filling, and in proof cited a single instance in his observation wherein gold had been renewed once and then succeeded by a stopping of gutta percha, which latter still held good.

He then stated his division the—

9th. "Amalgam *per se* is a poor filling material."

The speaker said he had tabulated 22,000 in the past fifteen years. and observed that 71 per cent. of gold fillings failed, and 54 per cent. of amalgam fillings failed also, but he explained that many of these latter were put in by slovenly operators, but was careful not to speak of the skill of the operators who had introduced the former (gold) fillings. In this respect he seems to have literally carried out his expressed early determination to "not undertake to discriminate nor use judgment." Dr. Flagg stated that gutta percha could not be put into a cavity so as to make a water-tight plug, yet insists that it is the very best material for filling teeth with.

10th. "A plastic material lowers the standard of Dentistry, thereby reducing its usefulness." "Yes! it lowers the standard that makes good gold fillings a necessity, but infinitely raises the standard of Dentistry that has for its end the saving of teeth." He said that "in the mouths of the six worst patients" in his practice, of ages raging from twelve to sixty years, from July, 1865, to July, 1867, "not one has been lost." If these six patients were the "worst" in the whole practice of a man who, at the outset, had determined to "set" and observe, without attempting to "discriminate or use judgment, but took them as they came," the probabilities are that amalgam, and even gutta percha, was good enough for that particular "*six.*"

Dr. Flagg made the remarkable statement that of 500 patients for whom plastic fillings had been used during twenty years, not one tooth had been extracted during that time. Also, that in 100 teeth properly filled, amalgam will cause less discoloration than gold. He made some further statements of a similar character, but it is not best to impose too far upon the credulity of readers!

The first paper of the morning session was by Dr. Henry S. Chase, of St. Louis, subject, "Some Experiments in Plastic Fillings."

Dr. Baker made a few remarks upon the subject in general, and was followed by Dr. Dwinelle, of New York, who spoke as follows:

"I don't know what you were talking about when I came in, but I have a few remarks to make about the tirade of words that we heard last evening, that were as meaningless as they were voluminous."

"It is an infamous doctrine that we heard last night, that we are doing more harm than good, and when we are told by the missionary, who comes among us to propagate this strange doctrine, that there have been only five teeth lost in twenty-two years for 1,300 patients where plastic operations were performed, *I don't believe it.*"

Dr. Dwinelle said further that, in reference to having disintegrated dentine to protect the dental pulp when it would otherwise be exposed, he had advocated and published that doctrine thirty years ago, and that he could show the same printed in the book which he held in his hand at that moment, and from which he read a few passages in proof of his statement.

Dr. S. B. Palmer said gold, amalgam, or anything might be employed to save decayed teeth, but that similar causes always produced similar effects. "Any agent placed in the teeth while they are immersed in the fluids of the mouth, always increases chemical action." The point he made was, "which agent does this the least?"

Dr. Shepard wanted the profession to adopt some material that would save the teeth of the multitude. This was truly philanthropic.

It was observed that Dr. Flagg's records, from which he quoted so extensively the evening before, were not reliable, nor entitled to the degree of confidence the builder reposed in them! Dentists well know that patients are prone to be mistaken, when the record of their work done is at hand. Operations claimed to have been performed within the year or two are proven by the register to be several years older than the patient imagined. If patients are so often mistaken in their own Dentist's office, how much easier it must be for their impressions to prove incorrect when they pass into the hands of other Dentists afterward.

Dr. Flagg's statistics might be reliable if confined to his own work, provided it was entirely of systematic record, giving all the influences for or against success in each case. The accuracy of his deductions may, therefore, be seriously questioned, and ought to be. Tabulated hearsay is a very poor foundation upon which to build such unorthodox doctrine as Dr. Flagg advanced on this occasion.

Dr. Webb said, in substance, that if the ability was not in the operator himself he could not succeed. He thought there was no chemical action in cases where gold fillings were moisture tight, and no electric current, and in such instances gold was the best material to be employed. He thought unskillful operators with gold should use tin or some plastic filling material.

Dr. Clowes spoke.

Dr. Bronson stated the conditions that were essential to establish a current of electricity.

Dr. Brockway spoke of the unfairness of manner in which advocates of any doctrine presented their views. He thought that Dr. Flagg had been misunderstood, believing Dr. Flagg to have meant that plastic materials were better for very frail teeth than harder materials, such as gold.

Dr. E. A. Bogue asked Dr. Flagg whether he (Bogue) correctly understood that out of 1,300 teeth treated by Dr. Flagg with plastic fillings during the last sixteen years, not one has been lost?

Dr. Flagg said such understanding was correct.

Dr. Bogue: "May we then infer that you consider yourself able to save all teeth, and have been able for twenty years so to do?"

Dr. Flagg: "Practically, yes!"

Dr. Bogue: "But have you not changed your mode of practice within twenty years?"

Dr. Flagg: "Yes, many times."

Dr. Bogue: "But if you had twenty years ago a mode of practice by which you could save all the teeth, why did you change?"

Dr. Flagg: "In hopes every time to get a better."

Dr. Daboll had not learned from Dental publications that gold was the *worst* material for filling teeth.

Dr. Flagg: "I didn't say so."

Dr. Daboll: "Well! for saving teeth."

Dr. Flagg: "Yes! I said that."

Dr. Dobell: "Well! there is little difference."

11:20 A. M.

Dr. Marvin read a paper; no debate. Dr. Kingsley followed. Further remarks by Drs. Louis Elsberg and Stephen Pearl Andrews, who followed out the subject of Dr. Kingsley's paper.

A paper by Dr. Farrar was then read, subject, "The treatment of alveolar abscess, involving necrosis," illustrated by experiments.

Dr. Atkinson gave a vivid definition of necrosis, and of what was erroneously so called. Some specimens then before the Society, the speaker said, were not necrosed. His remarks were instructive and flavored in his usual happy style.

Dr. Rich also spoke upon this subject, and was followed by Dr. Hill, who referred to the use of sulphuric acid in St. George's Hospital, Lon-

don, 1870. He detailed *his* treatment in the case of a young lady—a bicuspid loose and "discharging puss." The gentleman's procedure, according to his language, was certainly very remarkable and would have a tendency to "befog" any person who should accept his manner of treatment as final. He employed sulphuric acid on the "soft parts," in treating teeth that were discharging pus. His mode was—to use his own expression—he "squirted it in there," and let it "run all over the mouth and gums."

Dr. Rich objected to Dr. Hill's manner of applying such medicines, saying such a procedure was not only foolish but unscientific, and regretted to hear it so presented before such a body as that assembled.

After this subject had been closed, a paper was read from Dr. Thompson, of Topeka, Kan., subject, "The wisdom teeth, in connection with the hypothesis of the ultimate suppression of the teeth in man."

Dr. Kingsley strongly protested against the views presented by the essayist, and thought it going a long way too far to build up such an hypothesis. That the facts would not warrant such a theory as that presented by the paper.

Dr. Rich also commented upon this subject.

Dr. W. St. George Elliott read a paper on *Chinese Dentistry*, and interspersed with remarks upon Dentistry in Japan, giving items of the speaker's personal experience. The meeting then adjourned. There were a number of gentlemen who made interesting and instructive remarks during the discussion of the various subjects and essays, but time, and your space, which is valuable, will not warrant anything more than a synopsis, which is, perhaps, already too extended.

INTRODUCTION TO A COURSE OF LECTURES ON THE ELEMENTS OF DENTAL MATERIA MEDICA AND THERAPUETICS.

BY JAMES STOCKEN, L. D. S., R. C. S.,

Dental Surgeon to the National Dental Hospital.

The remark "that we live in an eventful age," has been a thousand times repeated; and each repetition is justified by something that has occurred to confirm it. The blessings of civilization are extended to quarters of the globe which were unknown to us a century ago; and

whilst Christianity has expelled the darkness of Paganism in those regions, experience has convinced the savage that labor is a more certain source of enjoyment than the precarious pursuits of the huntsman ; and that the spade and the plough are better instruments for procuring the means of subsistence than the spear and the bow. But the progress of knowledge has not been confined to newly discovered regions ; the advancement of the arts and sciences has exceeded the most sanguine expectations that our forefathers could have ventured to entertain. During the past fifty years more improvements in the arts of life, and more discoveries in science and natural philosophy have been made than the genius and researches of any two centuries in the previous history of the world have ever accomplished. One feature has peculiarly distinguished this period from all others, namely the rapidity with which the discoveries in sciences have been applied to the common purposes of life. What would the venerable Black (discoverer of latent heat) say, if he could see our towns as they are now, illuminated with the gas which he said, as he contemplated it burning in a lamp on the table of his lecture-room, "would never be anything more than a philosophical toy !" I think it was Wollaston who said that to light a town by means of gas would be impossible. What would be the feelings of the not less distinguished Watt, could he behold the uses to which steam is applied in the present day—the vessel, by the influence of this agent, tracking its course through the pathless ocean, in opposition to winds and tides, landing us at our destination in less than a tenth of the time it took the sailing vessel to accomplish an equal distance in the days of yore. Again, what marvellous results we have of the application of electricity in those most important inventions, the electric telegraph and the telephone. The former we thought so wonderful—and so it is—but it sinks into insignificance compared with the latter, which is truly marvellous, and yet how simple in construction.

The mental energy that could subdue and render subservient to the purposes of ordinary life such gigantic powers, could not be exerted without giving an impulse also to improvement in every useful art, and stimulating the minds of men to examine how far each occupation could be improved, both in reference to the personal interests of those engaged in it, and to the general advantage of the public. It is this discursive energy of mind that has called forth our particular school, and I have no hesitation in saying, if it be fostered as I trust it may, the school will be productive of the most beneficial consequences ; and I shall feel myself

highly privileged, if I should, in however small a degree, have contributed to this result.

The subject that I have been deputed to bring before your notice is one that has hitherto been kept quite in the back ground ; but a little reflection, I think, will convince us of the error of this. While the dental practice was confined to the stopping of teeth in an early stage of decay, and to extracting them when the disease had progressed so far as to affect the pulp of the tooth, or whenever inflammation had attacked the investing membrane of the fang, the dentist had no occasion to burden himself with a knowledge of Therapeutics or Materia Medica. We have, I trust, for ever passed beyond this early and crude stage of our profession. We possess a more correct knowledge of the relation in which the teeth stand to the other parts of the body, and we are beginning to inquire how far their diseases can be influenced by agents which act through the medium of the constitution. We are seeking for remedies which shall control and modify the effects of disease upon the membranes and pulp of the tooth in the same manner as they act on other parts of the body. We are giving up the destructive, and resorting to the conservative treatment of the teeth.

When caries is found to have passed beyond a certain stage, the question must be, How can I preserve this pulp and restore it to its normal condition, rather than how can I *effectually* destroy it. There are cases, in which to destroy may be the best mode of proceeding, but hitherto it is a practice which has been carried to an injurious extent, and frequently the pulp of a tooth has been destroyed which, by judicious treatment, might have been saved.

Already we have learnt that there are certain affections of the dental periosteum which a few years ago would have caused teeth to be condemned that at the present time we know may be cured by the use of internal remedies ; as in the case of rheumatic toothache ; we are aware that this blood disease may fix itself in the periosteum of the tooth, and that where this happens it can only be expelled by the use of medicines exercising a specific action over the rheumatic diathesis. Effects are also produced upon the membranes of the fang by the use of mercury, and a still more deplorable condition arises from the combined effects of syphilis and mercury. These disorders when not too far advanced, may be subdued by the use of appropriate remedies, and the teeth preserved.

For such reasons as these it has been considered that a course of lec-

tures on Materia Medica and Therapeutics is required to complete the education of the dentist, but at the same time it is necessary to treat these subjects with special reference to dental practice.

An account of the introduction of many of the substances which once figured in the list of our materia medica, and of the ideas which guided men in the selection and use of them, forms a curious chapter in the history of human credulity and superstition.

The history of medicine may be divided into three or four stages.

1.—Primitive or instructive.

2.—Religious.

3.—Philosophical.

4.—As a separate and independent science, freed alike from the dominion of theology and philosophy.

1st.—Primitive or Instructive :

In tracing the history of medicine in the different countries of the world, it will be found to have passed through certain stages of development, which are nearly similar in every instance, and belong to what has been termed the primitive or instinctive period. Man in an uncivilized condition is governed mainly by his feelings and instincts, and it is *these* which guide him, in the first instance, in the treatment of disease. An inflamed part is found to be soothed by the application of cold and moisture, and the use of these remedies is naturally suggested in all similar instances.

The lower animals also *instinctively* take medicine when ill, the cat and dog, for example. Melampus, a Greek shepherd, observed that his goats purged themselves with hellebore, and made good use of the knowledge thus obtained. The bees hermetically seal a dead body, which they cannot remove from their hives.

Accident has frequently supplied mankind with remedies, as is said to have been the case with Peruvian bark. We are told that an Indian, being ill of fever, chanced to quench his thirst at a pool of water strongly impregnated with the bark from some trees, which had accidently fallen into it, and thus he was cured. It often strikes one as wonderful that medicinal plants, &c., should abound in regions where the disease they cure abounds, as in the instance I have just recorded. Can it be explained without the idea of Providence, and so of a personal God? A question, methinks, for modern atheism (*Pharmacologia de Paris, vol. i.*, 1825).

2.—Religious :

During the next period, we almost invariably find that religion and

medicine are associated together. The health of the body, as well as the spiritual wants of the community, are entrusted to the priesthood. The books of Moses contain many hygienic directions, and a full account of the treatment which was ordered for leprosy and other diseases amongst the Israelites. The charge of the sick was entirely in the hands of the priests.

In Britain the Druids were both priests and physicians. The custom of administering *mistletoe* to epileptic patients, which continued in this country until a comparatively recent period, may be traced back to the time when these priests of the ancient Britons gathered it with a golden knife, on the 6th day of the new moon, and afterwards consecrated it with religious ceremonies in the sacred groves (*Paris Pharmacologia*).

The mythical period of Greece, which gave rise to the heroes and demigods of the Grecian theology, has handed down to us the names of certain persons celebrated for their skill in healing diseases, amongst them, Chiron and his far more celebrated pupil Esculapius. It was the descendants of the latter and their disciples who eventually established the worship of Esculapius, and formed a religious system, furnished with its temples, which, no doubt, were also hospitals and schools of medicine, and with all the paraphernalia of a regular order of priests and physicians. The descendants and priests of Esculapius were termed Asclepiades.

In Greece, therefore, during its second stage, medicine was not only associated with religion, but usurped to itself divine honors.

3.—Philosophical :

The active and speculative mind of the Greek led him to grapple with the most recondite questions of philosophy. He endeavored to explain the origin and nature of the universe, and to solve the mysteries which surrounded his own bodily and mental powers. From these speculations there had arisen several schools of philosophy, and, amongst others, that of Pythagoras (B. C. 590). This philosopher regarded the universe as an animated whole, of which divine intelligences, each ranged according to its perfection, in its proper sphere, were the members. It is impossible to reconstruct his system, but it seems to have been derived from those mathematical studies in which he was proficient. The *monad* denoted the *active* principle in nature (God); the *duad* the passive principle (matter); the *triad* the world formed by the union of the

two former. He also made use of music to elucidate his system. He wrote nothing, at least, none of his writings have come down to us; all we know of him is from Plato, Cicero and others, and that is most obscure. He had some queer notions about odd and even numbers. He discovered (it is said) what is known to us as the 47th Prop. of 1st book of Euclid, and so rendered more good to mankind than came of all his speculations. He supposed the number of the heavenly bodies to be ten, assuming the existence of a counter-earth on the other side of the earth.

Heraclitus, one of the disciples of Pythagoras, maintained that fire was the origin of all matter, and that from the different combinations of its particles, which were in perpetual motion, were derived the four elements.

Hippocrates, a Greek, born about 460 B. C., adopted the doctrines of Pythagoras as modified by Heraclitus, and imported them into the science of medicine. He considered that the body was made up of the four elements, combined in different proportions in different individuals. There were also four elementary qualities or conditions of matter—the hot, the cold, the dry, and the moist. The combination of the elements in these four states produced the four cardinal elements—blood, bile, black bile, and phlegm. The preponderance of one or other of these fluids constituted the four temperaments—viz: the choleric or billious, the antibillious or melancholic, and the phlegmatic or pituitous. The writings of Hippocrates constitute a complete summary of medical doctrine and practice as taught in Greece from 500 B. C. to 322 B. C. Hippocrates lived at the highest period of Greek civilization and enlightenment (the age of Pericles), being the contemporary of Socrates and Plato. He created a new era in medicine, which henceforth became an independent science.—*From Monthly Review of Dental Surgery.*

(*To be continued.*)

DENTAL LEGISLATION IN OUR STATE.

For the past month items and short articles have appeared in the daily papers of New York City and Brooklyn having reference to certain proposed legislation at Albany concerning the legal qualification that shall be required of "the dentist of the future," and that, too, of the not very remote future. We cannot at the moment better bring the subject

to the attention of our readers than by reproducing the subjoined circular, issued from Brooklyn:

The undersigned, practising dentists in the City of Brooklyn, desire to call attention to the following bills now before the Legislature of this State, believing that those whom such laws, if passed, would most nearly concern should be allowed an expresssion of opinion before action is taken.

The following was recently introduced into the Assembly by Mr. Galvin, of New York:

Section 1. Section 9 of the act entitled "An Act to amend an act entitled An Act to incorporate dental societies for the purpose of improving and regulating the practice of dentistry in this State," passed April 7, 1868, is hereby amended so as to read as follows:

Sec. 2. Any person who shall knowingly and falsely claim, or pretend to have or hold a certificate or license, diploma or degree, granted by any society organized under and pursuant to the provisions of this act, or who shall falsely, and with intent to deceive the public, claim or pretend to be a graduate from any incorporated dental college, not being such a graduate, or who shall practice dentistry for fee or reward, or represent himself as a dentist, without having first received such license or diploma, shall de deemed guilty of a misdemeanor.

Sec. 3. This act shall take effect immediately.

The following was introduced by Dr. Hayes:

Sec. 3. It shall be unlawful for any person to practice dentistry in the State of New York unless such person shall receive a diploma or license from the faculty of a dental cellege or from the Censors of the Dental Society of the State of New Yotk, duly incorporated; provided that nothing in this act shall apply to any person now actually engaged in their own name in the practice of dentistry before the 1st day of May, 1879.

Sec. 4. Any person who shall practice dentistry, without having complied with the requirements of this act, shall be guilty of a misdemeanor, and, upon conviction thereof, shall be fined not less than one hundred nor more than five hundred dollars for each offence, one-half of such fines to be paid into the county treasury where such conviction shall take place, for the benefit of the common schools of said county, and one-half shall be paid to the informant; provided that nothing in this

act shall be construed to prevent graduates and licentrates of physic and surgery from practicing dentistry.

SEC. 5, This act shall take effect immediately.

We are opposed to the passage of all such retroactive and proscriptive laws, for the following, among other reasons :

1st. They are not demanded by any general sentiment existing in the dental profession ; on the contrary, we affirm that a very large majority of practitioners, including many of the most respectable and eminent men in the ranks, are opposed to the passage of such laws, believing that they would prove detrimental to the progress and elevation of the profession and to the general interest of the community.

2d. They are not demanded by the public at large, who are now being year by year better served under the existing order of things, and whose interests will, in our judgment, be better protected by the enforcement of a law directed against malpractice alone.

3d. The proposed law will work great injustice and injury to a great number of able, industrious, and useful members of the profession who have for years enjoyed and deserved the confidence of their patients, in that it will subject them to the imputation that they have been engaged in practice without having been properly qualified, and thereby may seriously affect their material interests.

Desiring to obtain an expression of opinion on this question which has not heretofore been had, we propose to present the subject in this manner to every dentist in the State, and would respectfully request you to fill out and return the enclosed card without delay.*

Albert H. Brockway, James E. Miller, C. F. Graves, A. N. Chapman, Thos. Fry, I. C. Monroe, C. E. Brooks, Chas. D. Cook, F. W. Dolbeare, J. B. Brown, Marcus L. Bailey, J. N. Farrar, Geo. W. Brush, C. F. T. Jones, C. P. Crandell, John C. Wyman, L. H. Robinson, Wm. Shick, Thos. Manson, I. M. King, F. LeRoy Tetamore, Chas. H. Mosely, W. N. Bush, C. W. Harreys, E. H. Dickey, Geo. W. Burch, F. S. Emerson, Sam'l H. Twitchell, E. C. Wadsworth, P. M Leproham, Wm. Fishbough, Simon Schleecher, T. A. Quinlan, H. B. Follett, D. R. Longnecker, Wm. H. Johnston, Geo. Wales, Chas. H. Genung, Henry Biggart, Wm. H. Young, Lloyd P. Willis, L. Fraze, Edwin Heald, F. P. Abbott, N. M. Abbott, Owen E. Houghton, M. L. Thompson, Robert T. Holly, Chas. J. Cooper, G. L. Mason, H. G. Mirick, John J. Pitts, James H. Race, E. H. Miller, S. F. Cook, O. C. Cobb,

David S. Skinner, S. W. Bridges, M. Connor, Edwin T. Rippier, O. C. Forsyth, Jr., Geo. W. Fraim, H. T. Darrow, Robt. Bogardus, Jno. E. Cornell, A. D. Goddard, F. C. Walker, R. M. Stratton, Chas. C. Allen, Thos. J. King, W. C. Tracy, W. W. Smith, J. H. Mosely, J. C. Andrews, T. J. Perrine.

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* The card referred to in the circular contained the following questions :

Do you approve of any legislation regulating the practice of dentistry, which shall COMPEL Dentists now in practice to procure diplomas or license from any source ?

SIGN. .....

Would you approve of a law making it incumbent upon all hereafter entering the practice of dentistry to procure a diploma from some legally authorized Dental or Medical College ?

SIGN NAME AND ADDRESS. .....

NOTES.

Fifteenth Annual Meeting of The Lake Erie Dental Association will be held at Sharon, Pa., commencing Tuesday, May 7, 1878, at 10 o'clock A. M. Three days' session. All sessions open to the public. Board can be obtained at the Messer House at $1.50 per day. Trains on the E. & P. R. R. arrive from the North at 10:45 A. M., 6:40 and 7:57 P. M.; from the South at 10:45 A. M., 5:11 and 8:13 P. M.. On the A. & G. W. R'y.: From the North at 9:05 and 10:33 A. M., 8:50 and 12:23 P. M.; from the South at 6:45 A. M., 3:15 and 4:40 P. M. Dr. E. R. Allen, Girard, Pa., President; Dr. S. Davis, Parker City, Pa., Vice-President; Dr. C. B. Ansart, Oil City, Pa., Secretary; Dr. W. E. Magill, Erie, Pa., Treasurer. Subjects of essay for discussion: 1. The Effects of Diseased Teeth upon the System; Dr. John Murray, Rochester, Pa. 2. Management of Proximal Surfaces; Dr. S. Davis, Parker City, Pa. 3. Dental Education; Dr. C. B. Ansart, Oil City, Pa. 4. Facial Neuralgia; Dr. A. W. Maxwell, Meadville, Pa. 5. Periosteal Inflammation—Causes, Progress, Treatment; Dr. H. A. Tunison, Sharon, Pa. 6. Best Mode of Inserting Pivot Teeth; Dr. R. V. Belles, Mercer, Pa. 7. Artificial Dentures; Dr. M. B. Narramore, Linesville, Pa.

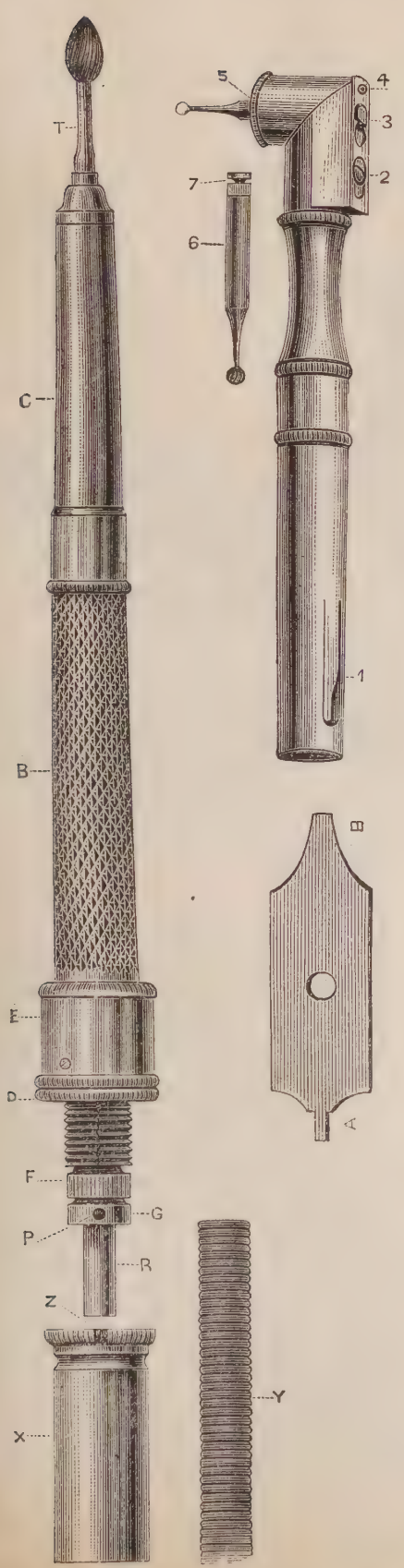
JOHNSTON BROTHERS'

Cone-Journal Hand-Piece

FOR ANY DENTAL ENGINE.

The Greatest Improvement in Dental Engines since 1872.

PATENTED MAY 18, 1877.



We advise our friends to purchase and use the Cone-Journal Hand-piece, for the following reasons:

1st. It is the only Hand-piece constructed in accordance with mechanical principles, and in such a manner that the spindle will not wear so as to run out of true.

2d. The adjustable conical journal-seat takes up all the wear on the journal, so that the Hand-piece will run as true after many months' wear as when new.

3d. Excepting only that of the suspension engine, it is the only Hand-piece which runs steady enough to carry a disk satisfactorily and without danger of breaking.

4th. It is so constructed that oil cannot find egress, either to the hand of the operator or to the lip of the patient.

5th. The conical journal at the nose of the Hand-piece is placed so far back, and is so protected, that no grit or dirt can reach it.

6th. It is the most durable Hand-piece ever offered to the profession, and will not need frequent repairs; hence it is the cheapest to buy.

It is so proportioned that the various attachments used on the Cable or White Hand-piece can be used with this.

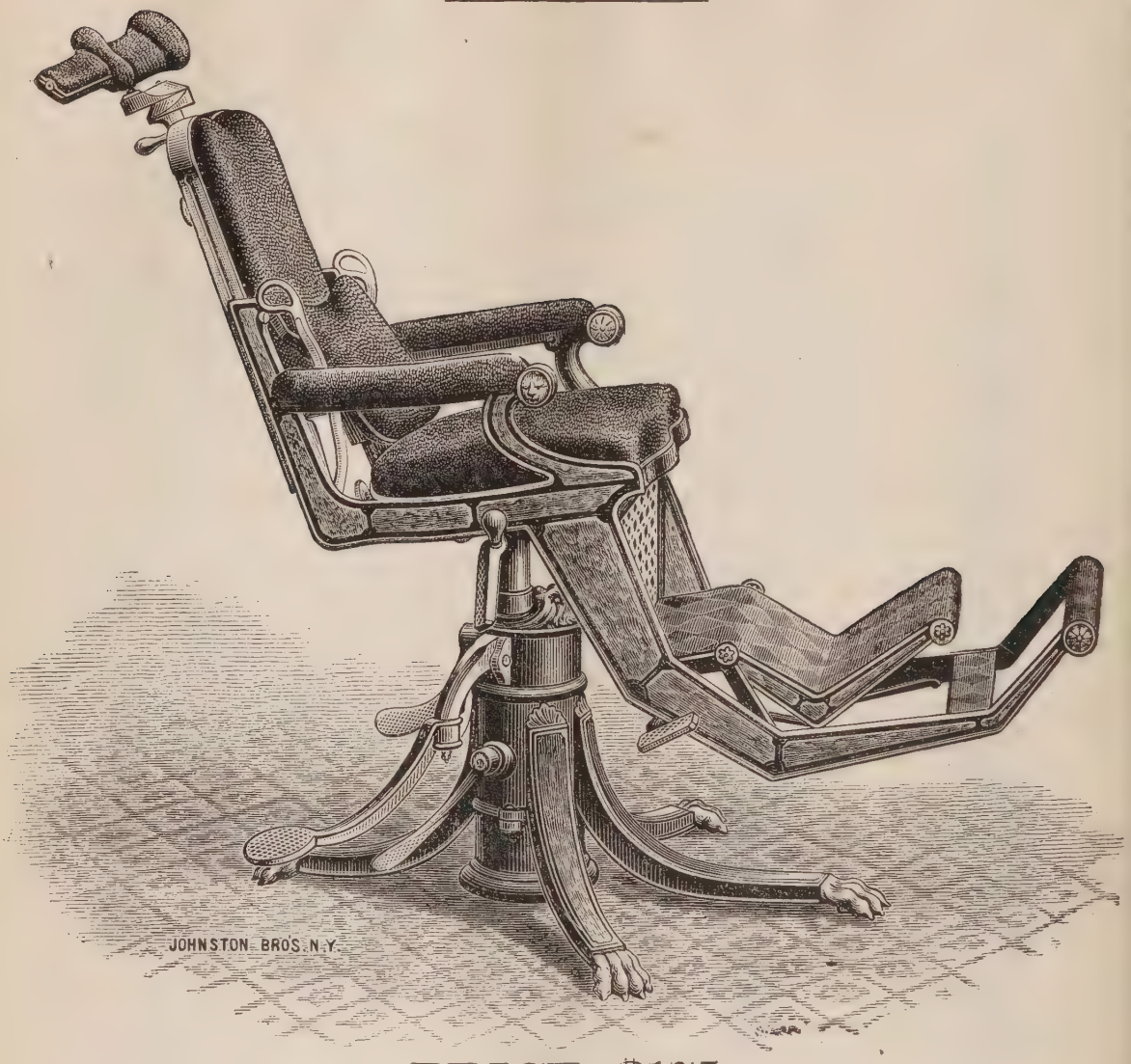
It uses our C (also the Universal) bur, and the White bur can be readily altered to use with this Hand-piece.

Send for Circulars. It is warmly recommended by Drs. Chas. F. Allan, Chas. D. Cook, Geo. L. Mason, Geo. S. Allan, S. G. Perry, N. M. Abbott, Delos Palmer, H. G. Mirick, R. F. Ambler.

Price of Hand-Piece, and one dozen Cavity Burs, $10.00.

Wilkerson Dental Chair.

PATENTED NOV. 20, 1877.



PRICE, $175.

The cut is a good representation of this unique chair. The acknowledged requirements of a first-class dental chair have been here secured by Dr. M. B. Wilkerson—the inventor—by methods showing great originality. All cranks are dispensed with and levers substituted for them. The chair is raised by pressure of the foot on the long lever, which hides the back foot in the cut. This operation requires very little effort, and occupies but eight seconds, and is only equivalent to stepping up eight steps. To lower the chair one has only, with the toe of his boot, to raise the lever just back of that first named, and the chair sinks rapidly and noiselessly until the lever is dropped, when it instantly stops. Except when in use the long lever folds in under the chair.

A touch of the lever in front of that just named, leaves the chair free to rotate through the whole circle. Directly beneath the seat of the chair, and close to the seat, is shown a lever, which, when pressed forward, permits the rocking movement while the lever is held, but whenever released fastens the chair in position.

Thus the three principal movements, elevation, rocking and rotation, are accomplished. The minor movements, all of great importance, however, are the raising or lowering of the back of the chair; the raising in like manner of the head-rest; the slight rocking of the seat of the chair, so as to prevent the patient from sliding forward; the adjustment of the footstool at various lengths and heights; the spring back support to rest the small of the back. This, at will, is converted into a capital child's seat.

An arm-rest is shown at the right of the head-rest. It can be secured on either side of the head-rest at will.

The whole chair is of the most substantial construction and highly ornamental. It will be upholstered in either green or garnet plush or in leather.

This is *not* an hydraulic chair. It has *no pump*, but is raised simply and solely by a lever actuated by the foot. When raised, the elevation of the central column, which supports the chair, tends to produce a vacuum in the chamber through which it passes, and this chamber is immediately filled by a column of oil, which, opening a valve at the bottom of the chamber and directly following up the central column of the chair, blocks it up whenever the lever ceases to raise it higher. Of course, whenever the same valve is tripped, the oil flows back into its receptacle, and the chair is rapidly and noiselessly lowered. *Not one drop of oil* has ever or can ever find egress from the inner base of the chair to its exterior. So much to silence constant misrepresentations of another dealer.

ADVANTAGES.

1st. It can be raised with the foot of the operator, and by a very slight effort.

2d. It can be raised in half the time of any other dental chair, except the Morrison.

3d. It can be lowered without exertion of force, and as much or as little, or as fast or as slow, as desired, by merely opening a valve.

4th. Its range of movement is superior.

5th. It has a perfect forward and backward movement, so that the patient can be rapidly inclined at any angle by a very slight exertion of force by the hand.

6th. Its arrangement for children is unique and excellent.

7th. Its footstool is readily adapted to the wants of large or small persons.

8th. Its head-rest is completely firm in any position in which it may be placed, has a large range, and is fastened by a single movement of the hand.

9th. The operator can control all its movements without once taking his hand from the mouth of the patient.

10th. It has a perfect rotary movement.

11th. By means of an adjustable foot it will stand firmly on any floor, however uneven.

We have orders for a large number, and are receiving more daily, and entering them in rotation.

JOHNSTON BROS., 1260 Broadway, N. Y.

JOHNSTON BROTHERS & SELBY, 23 N. Charles Street, Baltimore, Md.

Comfort for both Operator and Patient, Rapid Movement, Simplicity of Construction, Great Durability.

The desirable features of a dental chair are almost completely enumerated above. The Morrison Chair answers each of these requirements more completely than any other chair made.

It contributes to the ease of the operator:

1st. By the lightness and rapidity with which the patient is raised or lowered to a convenient position.

2nd. By the form of its back, which is so narrow as to render it unnecessary for the operator to stretch to reach his patient.

3d. By permitting him to drop either arm of the chair entirely out of his way.

4th. By making it possible to operate in either a standing or sitting posture with equal facility.

It affords comfort to the patient:

1st. In the arrangement by which the lower back-pad may be moved forward to support the small of the patient's back.

2nd. The upper back-pad is readily raised or lowered, so as to exactly adapt itself to the wishes of any patient as if the chair had been made for this one person.

3d. By the readiness with which the patient may change the foot-stool from one position to another as suits their notion at the moment, and without disturbing the operator.

If desired this chair can be furnished with either the usual upholstery of dental chairs, or with Turkish upholstery—soft and with springs; or with summer seats and back—of cane; or with separate sets of all of these, which can be changed from season to season by the owner without difficulty or the necessity of employing mechanics of any kind.

Its movements are very rapid.

It can be raised from its lowest position, in which the seat is 15 inches from the floor, to its highest, 42 inches above the floor, in seven seconds. Both low

and high based chairs are here combined in one, giving a vertical range of more than two feet.

It has no equal in operations upon Children.

The child can be raised as high as needed by the tallest operator.

It is provided with a comfortable back and head-rest, exactly as is a grown person.

The foot-stool is quickly adapted to children of any size.

It is extremely simple.

The principal movements of the chair and head-rest are all under control of but three clamps, and the chair is adjusted in height by a single crank.

By one of the above-mentioned clamps it is securely fastened at any desired inclination, and all done in an instant.

It is very durable, because

1. Being made almost entirely of metal, open joints or season cracks are impossible.

2. The upholstery of this chair is so arranged that it can be renewed, by exchange of the upholstered parts, without leaving the rooms of the operator and at moderate expense.

ACCESSORIES.

CASTORS.—To secure the *rotary movement* for such persons as desire it, legs have been cast, having recesses in the feet, into which Castors are inserted. The castors in the front legs roll laterally only, so that by them the patient's face may be turned to the light. When in the right position a locking device permits you to fasten the castors so that they cannot be moved until unlocked. The castors in the back feet are so placed as to revolve only back and forward, so that while they permit you to easily roll the chair like a wheelbarrow out of position if you wish to sweep, they cannot be moved by the force exerted in plugging a tooth.

NARROW BACK PAD.—To be used sometimes instead of the top pad, and sometimes as a third pad when the back of the chair is stretched to full length.

SPITTOON ATTACHMENT—see in the cut—is a cheap and convenient substitute for a separate spittoon. Is more convenient and costs less.

HEAD-REST.—The Morrison Head-Rest is a *thoroughly* good one, and has given general satisfaction. It is supplied with the chair if we are not otherwise directed, and the price of the chair as named includes this rest. The Johnston Head-Rest is *our latest*, and is everywhere approved. It can be had with the chair at an extra cost of $8.00. It is shown in the cuts.

EXTRA UPHOLSTERY.

Turkish Upholstery.

Some persons having desired a softer style of upholstery than is usual in dental chairs, we have adopted, after many experiments, a modification of what is usually known as the Turkish chair. The seat is made about four inches higher in front than at the back, and both it and the lower back are made very soft by the liberal use of steel springs and hair, the edges being kept full by a piece of heavy spring wire which is built into the upholstery.

The perpendicular edges are covered with a puffing to match, and "set off" with handsome silk cord.

The arms and upper back pads are made heavier than usual, and are puffed and corded to match the seat.

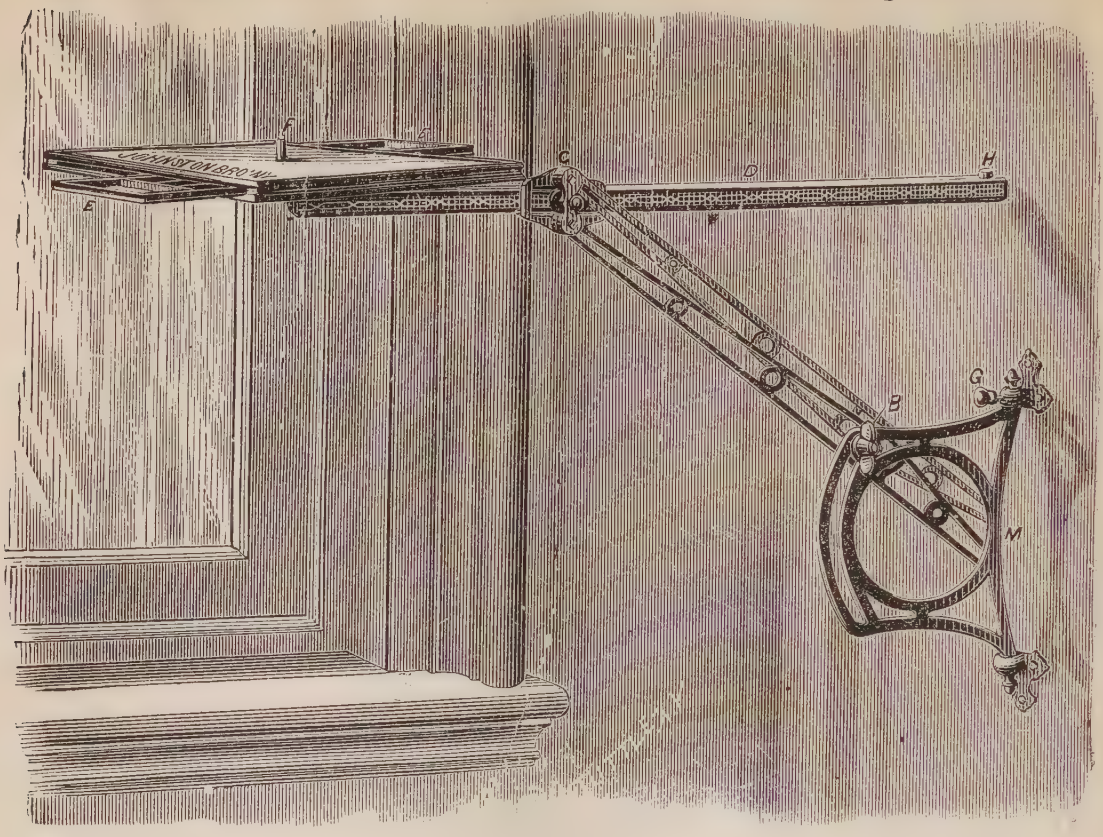
Real Morocco.

We also have produced a very elegant article by the use of real morocco, handsomely embossed. It is durable and particularly desirable for warm climates.

PRICES.

In fine green or garnet plush—with Morrison Head-rest	$ 150.00
Boxing	5.00
To which price add, if ordered:	
With Castors	10.00
With Johnston Head-rest, instead of Morrison	8.00
With extra back-pad	4.50
With spittoon attachment and porcelain cuspador	8.00
With nickled metallic cuspador and gold trap	10.00
With nickled metallic cuspador and gold trap, and nickled spittoon attachment	18.00
With Turkish upholstery	15.00
Real morocco embossed	10.00

MORRISON DENTAL BRACKET.



PRICES.

With Black Walnut Table, 12 inches square.....$25.00.
With Rosewood Table, 14 inches square, and Velvet Top, and Drawers about five-eighth inch deep, lined with Leather..... 40.00.
The Rosewood Table alone, as above, to fit any Morrison Bracket..... 17.00.
Boxing..... .....$1.00.

The cut represents the table in its highest position, and distant from the wall a little more than half the distance it is capable of taking. By loosening the thumb-screw B, and allowing it to rest in the bottom of the slot, (instead of at the top as represented here,) the table will occupy a position as much below M as it now does above the same point. The extreme range, that is, the distance between the table when at its highest and its lowest position, is 24 inches.

M represents a metal frame which is secured to the wall or other support by screws. It swings from side to side as a gate on its hinges. C. M. represent light but strong metallic arms, hinged at M as a centre and moving up or down. At B is a thumb-screw passing through a slot in the frame M. By it the arms can be firmly clamped at any desired height.

At C is a slide-rest through which the hollow rod D passes freely, and may be clamped at any distance from its ends. At one end of this bar a square table is supported, having in it foil and instrument drawers. This table is capable of rotation round F, which is the burner of an alcohol lamp, the alcohol being contained in D and introduced at its further extremity H. Among the advantages of this bracket are these:

1st. It combines a greater variety of range and movement than any other.
2d. It is rigid in whatever position it is clamped, and will hold 15 lbs. with steadiness.
3d. It provides a clean receptacle for foil and instruments.
4th. It is obvious that a square table is very much more convenient as an instrument stand than a round one.
5th. Its drawers extend through the table and can be opened from either side.
6th. To those having a Morrison Chair it is almost indispensable, as it will follow the chair to either its lowest or its highest position.

It is handsomely ornamented and nickel-plated throughout, so that it is a very beautiful addition to the furniture of the operating room.

JOHNSTON BROTHERS,
Broadway, cor. 32d St., N. Y.

HARVARD UNIVERSITY.

DENTAL DEPARTMENT.

BOSTON, MASS., 1878-79.

The plan of study of this School has been radically changed. Instead of the usual oral examinations at the end of the course, written examinations are had at the end of each year on the subjects pursued during the year, and instead of the customary repetition each year of the lectures and studies of the preceding year, the course is progressive over a period of two years, and the student is required to pass a satisfactory examination in the first year studies before being allowed to proceed to the next. At the end of the course a satisfactory examination must have been passed in all the subjects.

The new year begins Sept. 25th, 1878, and ends the last Wednesday in June, 1879. It is divided into two equal terms, with a recess of one week at Christmas, and another in April.

The University Degree, D.M.D (*Dentariæ Medicinæ Doctor*), is conferred upon those who fulfill the requirements.

FEES.

There are no fees for matriculation, for the diploma, nor for the demonstrators. For the first year a student is a member of the school, the fee is $200; for the second year, $150; for any subsequent year, $50.

For information address,

THOS. H. CHANDLER, Dean,

222 TREMONT ST., BOSTON, MASS.

FRENCH CROWN AMALGAM.

The Manufacturer says of it: The Amalgam is composed of materials which the dental profession at large recognize as the best (except gold) for filling teeth. It is of finest quality. It has the merit of becoming hard in fifteen minutes after being prepared for use, and does not change color or shrink.

PRICES.

1 oz. box, with mercury	$3 00
⅔ oz. " " "	2 00
⅓ oz. in envelopes	1 00

For sale at wholesale and retail.

JOHNSTON BROS., 1260 Broadway, N. Y.

JOHNSTON BROTHERS' LAVA STRIPS.

PATENT APPLIED FOR.

For finishing fillings, a new and unequaled polishing material.

Thinner, more convenient and more efficient than corundum tape.

Price, per Box. .....50 cts.

JOHNSTON BROS., 1260 Broadway, N. Y.

LIQUID NITROUS OXIDE.

N O

No other equally safe anæsthetic is known. While Chloroform and Ether are killing scores, if not hundreds, annually, Nitrous Oxide, although used many times as frequently as either of the other anæsthetics named, proves itself entirely harmless; and this too, though very commonly an impure article of Nitrous Oxide is exhibited. The Nitrate of Ammonia ordinarily furnished in the market is far from being chemically pure, and the products of its decomposition are too often impure Nitrous Oxide and Bin-oxide of Nitrogen. The latter is a gas of which the chemist, Brande, says:—"It is rapidly fatal to animals"—and again, (of the reddish fumes which result from its admixture with air, which fumes most dentists have seen while making Nitrous Oxide,) "These are fumes of Nitrous Acid, ($NO^2+2O=NO^4$). They have a peculiar suffocating odor, and are highly irritating and corrosive—*care should be taken that they are not breathed, even in a dilute state.*" All danger from this source may be avoided, however, by making use of *Liquid* Nitrous Oxide, which, being prepared constantly and in large quantities, under the direct supervision of a chemist, is certain to be pure. *No instance* of fatal results following the administration of pure Liquid Nitrous Oxide Gas is known. The following statistics, showing the comparative safety of several of the leading anæsthetics, have been before given by us, but cannot be too often brought to the notice of those who are constantly called upon to relieve suffering by means of these agents.

From a careful examination of the statistics of 200,893 cases, Prof. E. Andrews gives, in the *Chicago Medical Examiner*, the following estimate of the relative danger from different anæsthetics:

Sulphuric Ether	1 death to	23,204	administrations.
Chloroform	1 "	2,723	"
Mixed Chloroform and Ether	1 "	5,588	"
Bi-chloride of Methylene	1 "	7,000	"
NITROUS OXIDE	**no Deaths in**	**75,000**	"

Edward R. Squibb, M.D., than whom our country has no more able pharmaceutist and toxicologist, in a lecture on anæsthetics before the Medical Society of the State of New York, says: "Nitrous Oxide was the first anæsthetic; and the safety and certainty of its effects, even in inexperienced hands, for all momentary operations, and the promptness with which persons recover from its use, render it perhaps the most important of all anæsthetics, because destined to relieve a greater aggregate amount of pain, *with greater safety*, than any other agent."

Again—"If the surgeon considers the safety and saving of pain to his patient, first, and his own convenience in operating, second, he will hesitate before passing over such an agent as Nitrous Oxide."

It may be well just here to call attention to the fact that, when ether or chloroform is administered, it is not at all uncommon for the air about the patient to become so charged with the vapor as to somewhat affect the surgeon, taking from him perfect clearness of mental operation, and of the senses, and frequently leaving him with headache, and even nausea.

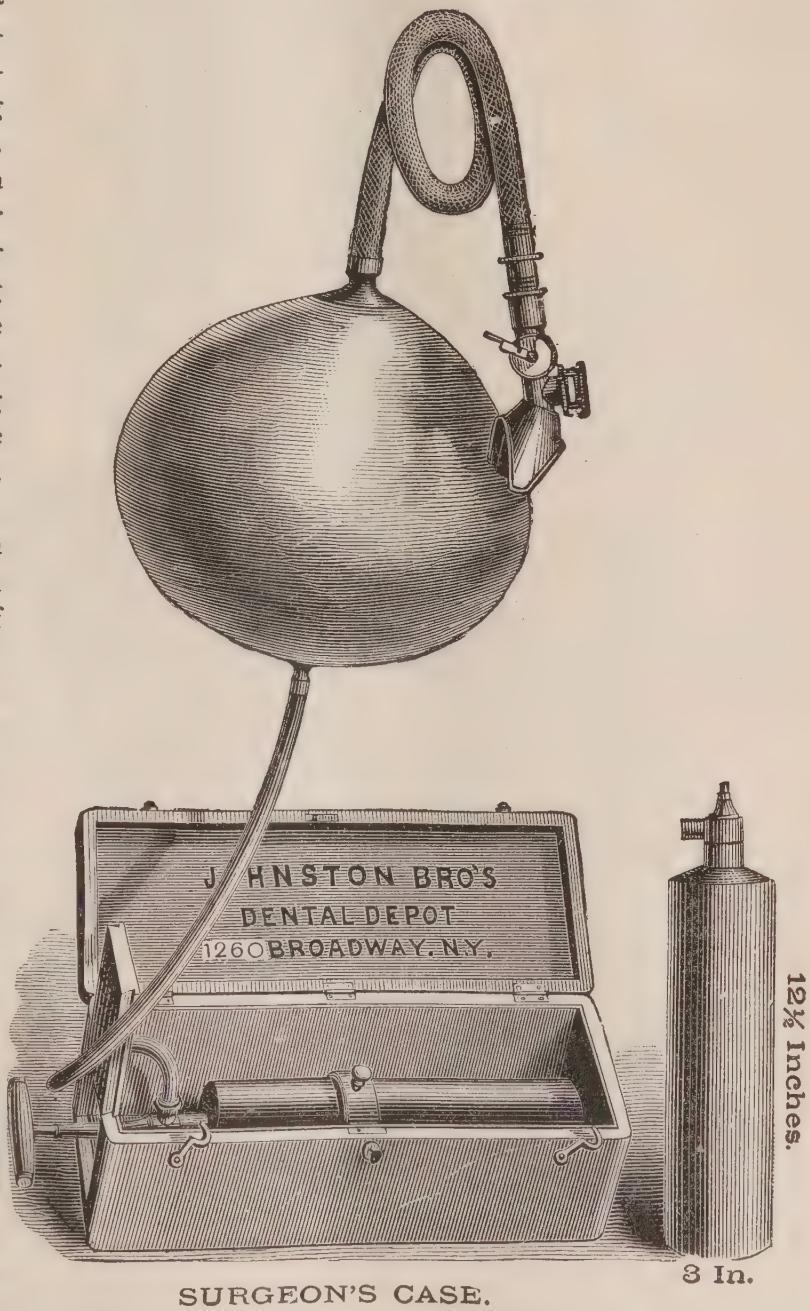
When Nitrous Oxide is given, nothing of this occurs, and the surgeon is in no way conscious of the presence of the anæsthetic, except as he sees its effects on his patient. This, we think, is a convenience to the surgeon.

Numerous and repeated trials of the Liquid Nitrous Oxide in capital operations in surgery, (as well as in momentary operations), during the two years just passed, attest the

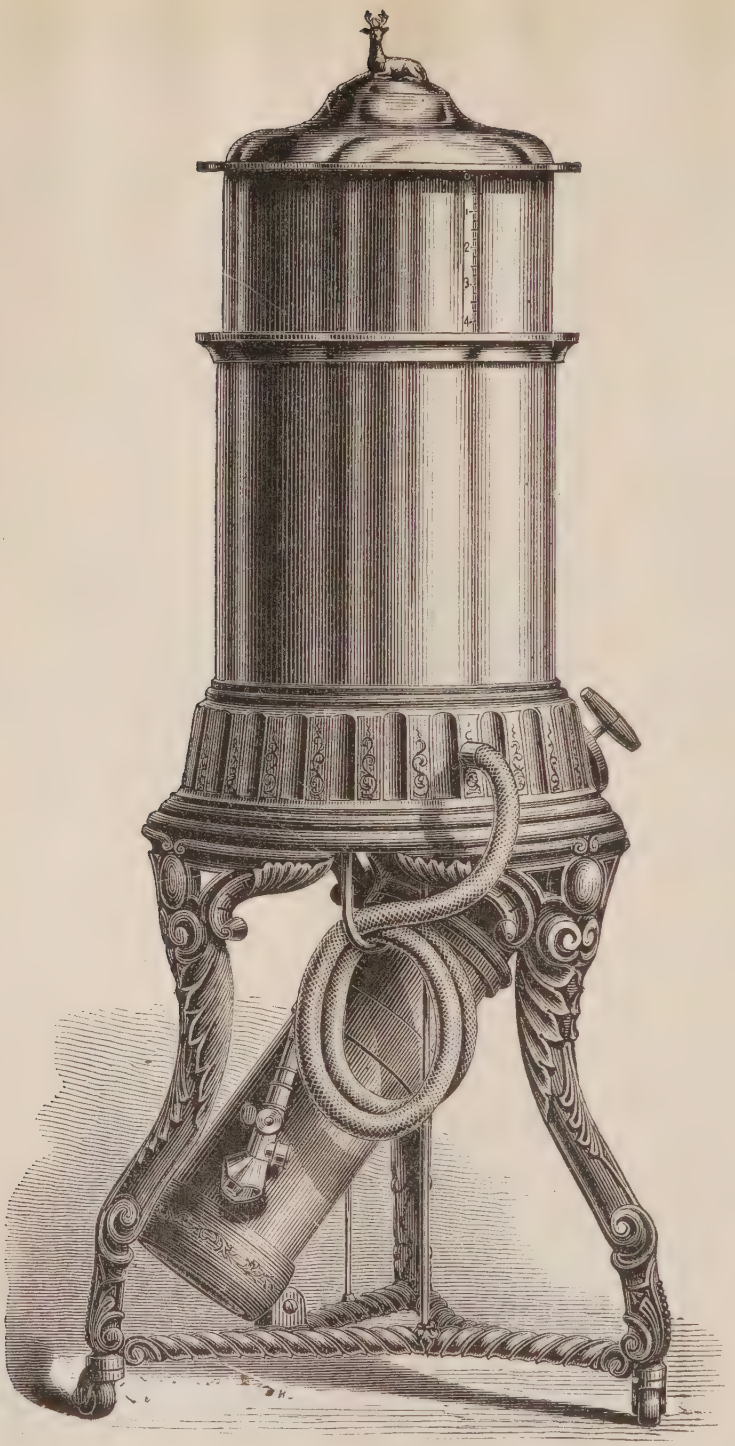
perfect adaptability of this agent to all cases where an anæsthetic is needed, and the time is not very distant when it will supplant its cheaper, but dangerous rivals.

Two styles of apparatus are provided for its administration. The most generally used, because of its cheapness and portability, is the SURGEON'S CASE.

This comprises a strong cylinder containing One Hundred Gallons of Gas; a strong morocco covered case, provided with an iron ring and set screw, by which the iron cylinder is held in place during use, and its delicate valve protected from injury; also, a rubber bag with rubber tube at one end for admission of gas, while an inhaling tube, handsomely covered on its outside, and provided against any possibility of a collapse by a tin-coated spiral of wire on its inside, is fastened at its opposite end; a metallic inhaler—nickled—having two spring valves, which answer to the slightest breath, either of inspiration or exhalation. The inhaler also has a two-way stop-cock or ground valve so arranged, that the gas being shut off, the patient may be allowed to breathe air until all alarm is dissipated, and then, by an unobtrusive movement of the fingers without previous notice, the air may be excluded and gas admitted. It contains also, a nickel-plated wrench and a nickel-plated key. In fact *all* the apparatus necessary for administering the gas. The whole case and contents weighs about fifteen pounds. This is here shown as open, and the bag which receives the gas from the cylinder, and from which it is exhibited to the patient, is represented as filled, and suspended above the case. The cylinder is also shown as standing at the side of the case. This is the simplest and most popular form of apparatus, and will be everywhere welcomed—because of its portability for use outside of the operating room.



SURGEON'S CASE.



NICKEL-PLATED GASOMETER

AND ORNAMENTED STAND

FOR LIQUID NITROUS OXIDE.

NICKEL-PLATED GASOMETER.

This style of apparatus is especially designed for those who use large quantities of Nitrous Oxide, or who may desire a highly ornamental piece of office furniture, coupled with a *really economical* gas apparatus, the gas being furnished in 1,000 gallon cylinders, at a reduction of 25 per cent. in price.

The cut on the opposite page represents the nickel-plated gasometer, mounted on a stand, with a 1,000 gallon cylinder, in position, under the gasometer.

Heretofore, gasometers have been so unsightly, that it has been considered desirable to place them in an adjoining room or behind a screen; we take pleasure now in offering to the profession a gasometer so handsomely gotten up, that it will be an ornament to any office, and at the same time so constructed, as to be vastly superior to any apparatus heretofore used. The gasometer will, when full, hold 10 gallons of gas —this is sufficient to completely anæsthetize any patient. The usual amount of gas given to a patient is from 3 to 5 gallons.

If it is desirable to keep the patient under the influence of the anæsthetic for any length of time, (as in a surgical operation), the operator has under his control 1,000 gallons of gas, by merely turning the key seen in the cut at the right. The gasometer is nickel-plated, highly polished, and mounted on a carved iron stand, which is japanned and ornamented with bronze.

On the bell of the gasometer there is a scale graduated in gallons, and fractions of a gallon, so that the operator can readily see how much gas he has administered.

Another valuable feature in this gasometer, is a peculiar water-check or valve, so arranged that though the gas will flow freely on the lightest inspiration at the inhaler, it is instantly and automatically shut off by the water when the patient stops breathing.

This does away with the necessity of closing any stop-cock, and prevents all waste of gas; it also saves the dentist's time at the most critical moment, as he has only, after having administered the gas, to lay aside the inhaler and proceed at once to operate without the necessity of shutting any stop-cock. The stand is so constructed that a small (100 gallon) cylinder can be used while the large cylinder is being re-filled.

We should also call attention to the fact, that there is no liability to loss of gas from leakage, caused by the operator's leaving the valve of the cylinder open, for if there is such escape from the cylinder, the bell of the gasometer will rise, and the operator will have his attention called to the waste, thus enabling him to correct the difficulty at once.

The whole apparatus is mounted on castors, and can be readily moved.

This apparatus is especially desirable where large quantities of nitrous oxide are used, or where it must be sent a great distance. In this form it is best to ship it by *fast freight*—which makes the cost of transportation very light. The gas can be kept for any length of time, and is constantly on hand *and always of the best quality.*

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.

Why Nitrous Oxide should be preferred to Ether or Chloroform.

1st. It is far safer—see foregoing statistics. Dr. Colton reports having administered it to thousands of patients, without a single accident.

2d. It acts quickly ; from one to two minutes being generally sufficient to bring a person completely under its influence.

3d. It seldom excites a patient to violence—a matter of great importance.

4th. Nausea is not often excited, even during a long operation. Eating, however, should not immediately precede the administration of the gas. It is contended by some operators of large experience, that *pure* nitrous oxide *never* causes nausea. In operations of the eye, or in the pelvic region, this peculiarity renders the gas invaluable, and it always is of much value to the patient's feelings.

5th. The shock given to the system by other anæsthetics, is almost as severe as the operation itself, and a slow return to consciousness and the normal condition detrimental to the recovery of the patient. Nitrous Oxide frees itself from the system as speedily as it produces its effects, and so adds nothing to the perils of surgery.

6th. It is no small advantage, as before recited, that, while using Nitrous Oxide, the operator feels no inconvenience from its effects, as he does not inhale it, while he cannot altogether escape the fumes of ether or chloroform.

REVISED PRICES.

Complete Apparatus—Surgeon's Case, with Metallic Inhaler	**No. 1**	$42 00
Complete Apparatus—Surgeon's Case, with extra sized Bag and Metallic Inhaler	**No. 2**	44 00

Boxing either, $1.00.

Each complete apparatus includes a 100 gallon cylinder, filled with Liquid Nitrous Oxide.

Cylinder with 100 gallons of Gas	16 00
Refilling Cylinder	6 00
Nickel-Plated Gasometer, with ornamented iron stand	128 00
Necessary adjuncts, (including Union Nut, Key-Wrench, Inhaler and covered Tubing)	12 00
1000 Gallon Cylinder	36 00

The above cylinder may contain more than one thousand gallons—say from 1000 to 1200 gallons—for which the price will be at the rate of 4½ cents per gallon, which is 25 per cent. less than the price in small cylinders.

Contents, if 1000 gallons would be, at 4½ cents	45 00
Morocco covered case, with ring and thumb screw, velvet lined	12 00
Polished bl'k walnut " " " " "	13 00

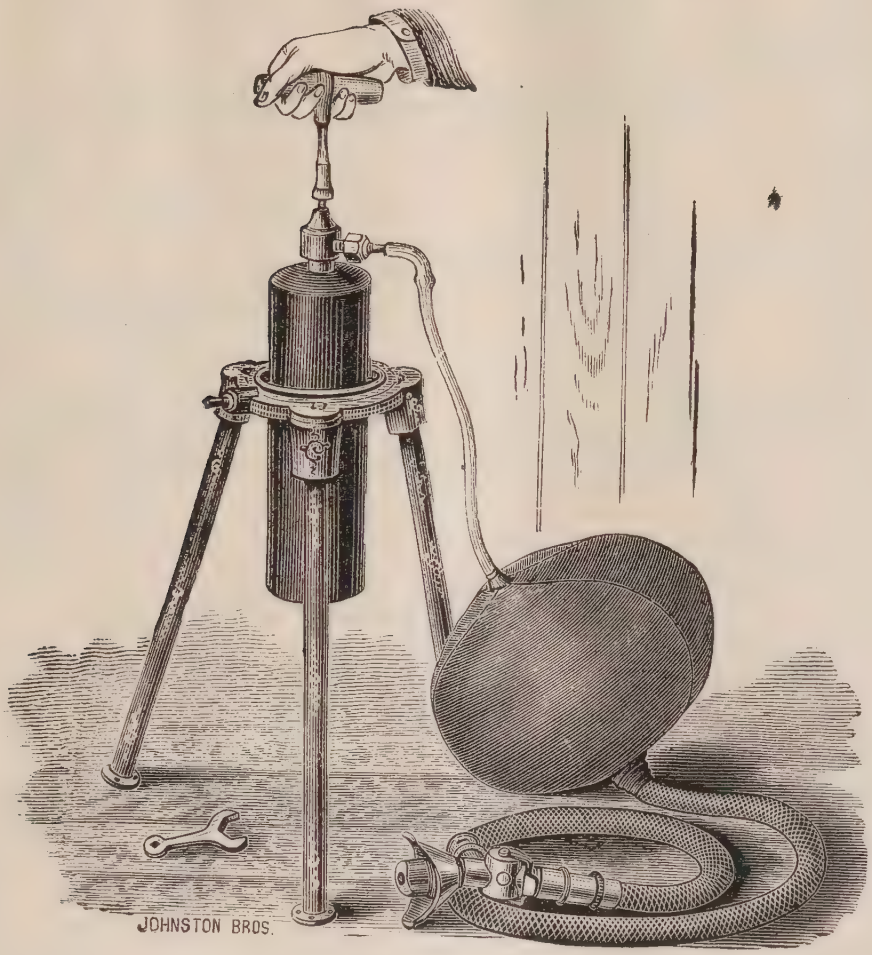
Or these latter we have only a limited number.

Rubber Bag, with covered inhaler tubing, (about 4 gall. capacity)	5 00
Rubber Bag, with covered inhaler tubing, extra size	7 00
Inhaler, latest style, with two way stop cock, adapted to the use of both dentists and surgeons, with connection	9 50
Key, Nickel Plated	1 50
Wrench, "	50
Union, Nickel Plated, (nut and tube), for connecting cylinder and gas bag	1 50
Covered Inhaler Tubing, per foot	50
Plated Connection to fit old style Inhaler	1 00

JOHNSTON BROS.,

Broadway, cor. 32d St., N. Y

NITROUS OXIDE GAS.



100 GALLON CYLINDER TRIPOD.

PRICE, $4.00.

We here show a representation of a tripod, handsomely japanned and ornamented, which is designed to hold the cylinder while in use, and is less expensive than the Morocco case, of the Surgeon's case.

Price adapted to 100 gall. cylinder.....$4.00.
" " " 500 " " ..... 6.00.
" " " 1000 " " ..... 8.00.

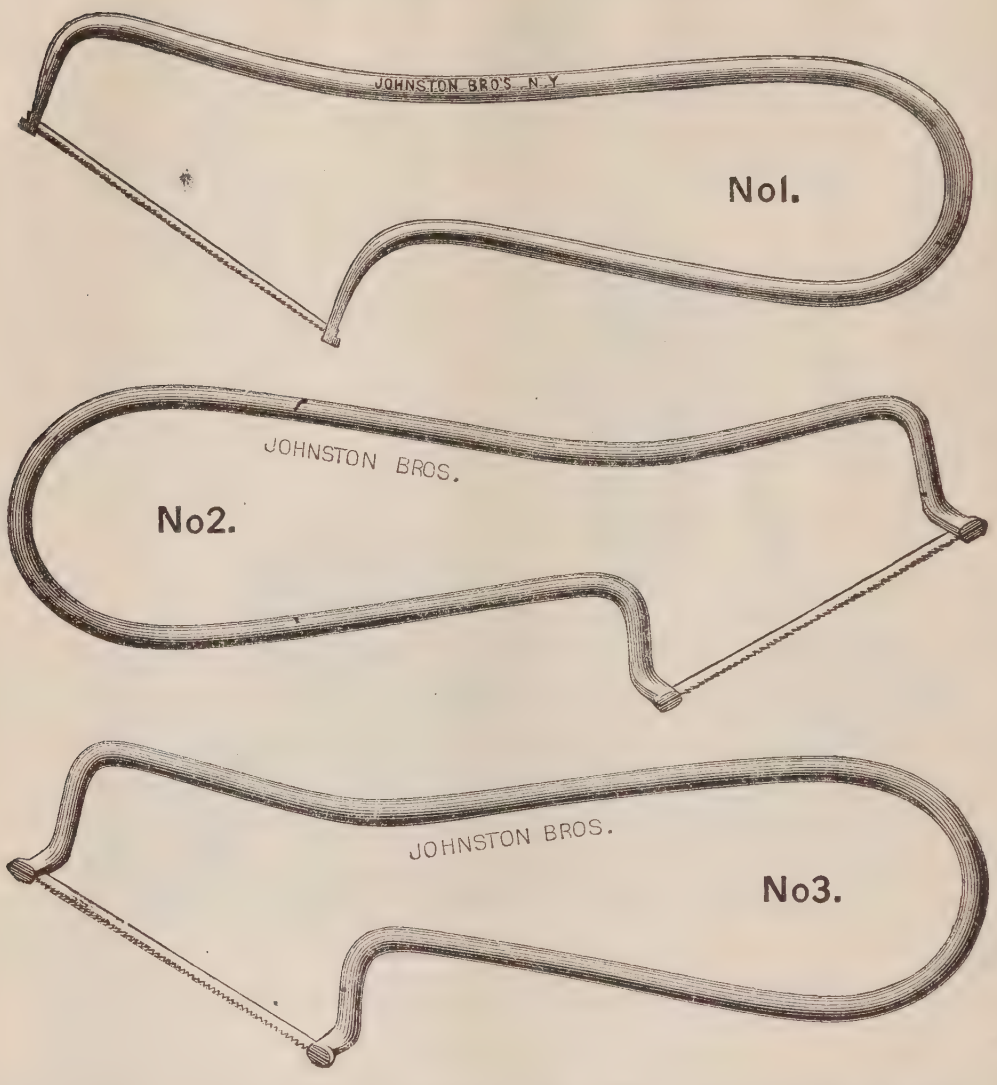
ADJUNCTS NECESSARY WITH EITHER TRIPOD, VIZ.,

Bag, Inhaler, Key, Union-Nut and Wrench..... .....$17.00

For other prices of Gas apparatus, see pages following.

CLAPP'S SAW FRAME.

PATENT APPLIED FOR.



In the form shown here this instrument, the device of Dr. Dwight M. Clapp, will be found very useful as a saw frame. The saws are firmly held in place, but can at pleasure be detached or inserted by pressing the wires of the handle together, the thumb being placed just beyond the extremity of the saw, on the handle, for that purpose.

These saws are in many cases superior to files in finishing fillings. Being much thinner than any file, they will pass between teeth, leaving less space (a thing often very desirable, particularly at the cutting edges of the teeth), yet sufficient to be followed by emery cloth or tape.

The saw can often be used between teeth that are crowded, where a file cannot. The saw being flexible—hard enough to cut the gold but not the teeth—will follow the space between, although it be quite irregular. It will cut much faster than a file and is less liable to break.

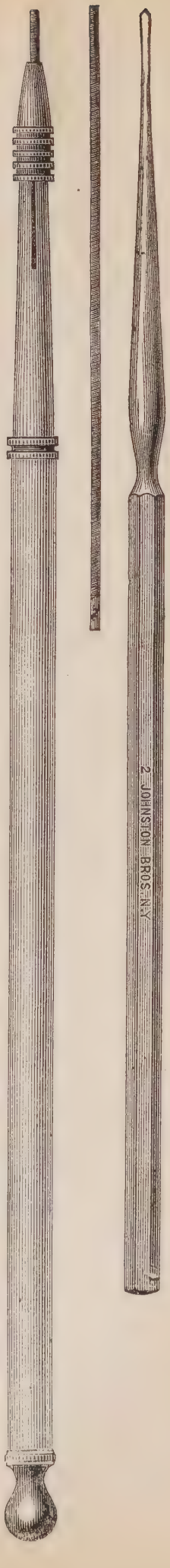
PRICES.

Saw Frame	50 cts.
Saws, per dozen	25 "
Frame and two dozen saws, postage paid	$1 00

JOHNSTON BROS.,

1260 Broadway, cor. 32d St., N. Y.

Morrison's System of Retaining Screws.



Dr. W. N. Morrison, of St. Louis, has furnished us models of his drill-taps and adjustable wire-holder, and gold wire, from which we have reproduced similar instruments or apparatus for the profession.

No especial description is needed in view of the thorough work of our artist. It may be well to call attention to the following facts: The drill-taps and wire fitted for each other bear corresponding numbers, as, 1, 2, 3.

The adjustable wire-holder takes either size of wire.

The cutting plyers are provided with two round openings in their cutting face. The long wire to be used if put in one of the openings can be "nicked" at the proper distance to form the screw while in the wire-holder, so that after having been screwed into place it may readily be broken off, without the use of file or plyers in the mouth.

In the above numbers of Drills, Taps or wire:
No. 1 corresponds to Mack's No. 0.
No. 2 " " No. 3.
No. 3 " " No. 1.

We make no number corresponding to No. 2 of Mack's system, it being very nearly the same size as No. — of Morrison's system.

PRICES.

Complete Set, including three wires, 3 inches long, with morocco case ..... $12.00.
Wire-holder, nickel-plated ..... $1.50.
Drills, each ..... 50 cts.
Taps, " ..... 50 cts.
Nippers, nickel-plated ..... $2.00.

	No. 1.	No 2.	No. 3.
Gold rods, each	$1.50	$1.20	$1.00.

JOHNSTON BROS.,
Broadway, cor. 32d St., N. Y

SUSPENSION DENTAL ENGINE.

(INVENTED BY DR. W. S. ELLIOTT.)

The Dental Engine represented in the accompanying plate is confidently recommended by us as sure to give general satisfaction.

Two or three years ago a few engines modeled on this, the Elliott, plan (suspension from the ceiling) were sold. Though imperfectly constructed, they have been uniformly commended by those who have used them.

Each of the two styles of Dental Engines which have found favor with the profession has advantages peculiar to itself.

In this form the driving power is belted directly to the shaft of the hand-piece, without the intervention of a flexible joint, and so *entirely avoids all the unsteadiness* or "chattering" which is almost inseparable from the flexible joint, even when short, and is unendurable where the non-rigid portion is long.

The Remodeled Engine, shown in our cut, has not only greater elegance of design than the Suspension Engine as previously sold, but, by its construction, obviates several objections to which the earlier model was liable. It was previously necessary to make the hand-piece large and heavy in order to give tension to the belt, and in furtherance of this purpose a considerable ball of metal was suspended from the rear of the hand-piece. As now made, the ball weight is dispensed with, the hand-piece being balanced and tension given to the driving-belt by placing a small pulley on the hand-piece spindle. The hand-piece is reduced to half its original weight, *and the slightest movement at its point can now be felt by the hand which guides it.* Among its advantages, those subjoined are prominent.

1st. It is more steady in its movement than any Engine made.

2d. Being suspended on a cord, it is free to move in any and every direction—hence the bur can be readily applied to any cavity, whatever may be its position in the mouth.

3d. It has an abundance of power.

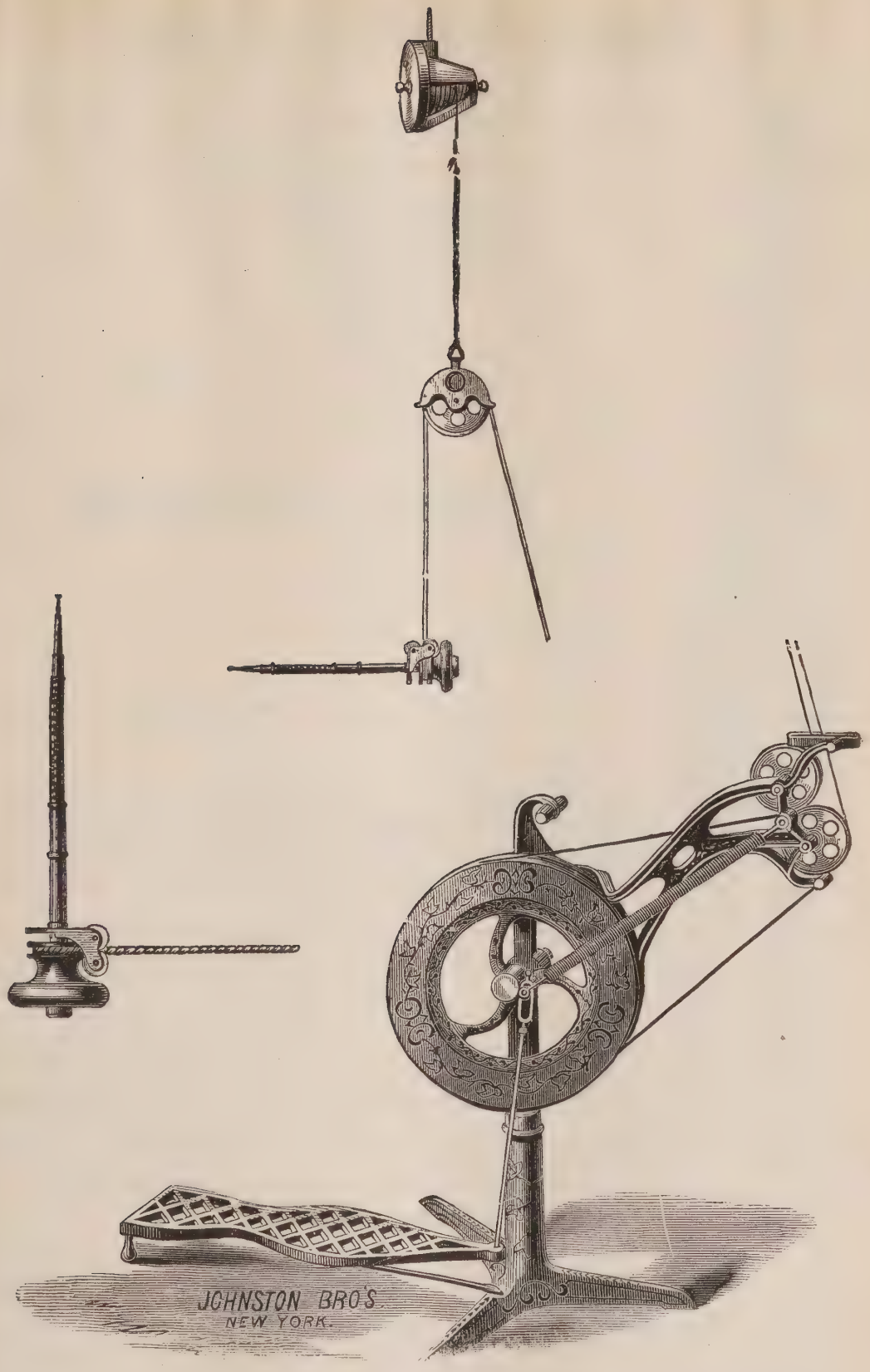
4th. It is not easily broken or likely to need repairs.

5th. It is, above all others, a "*light running*" Engine.

6th. The hand-piece, which formerly was particularly objectionable because of its size and weight, and because of the position occupied by the weight needed to balance it, is now scarcely larger than that of the Morrison Engine, and is fitted to use the same (C style) bur. For the balance-weight we have substituted *a fly-wheel on the shaft which carries the bur.* While keeping the hand-piece well balanced, this gives momentum and greatly increased steadiness to the cutting instrument.

Orders for this Engine will be entered in rotation as received, and promptly filled.

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.

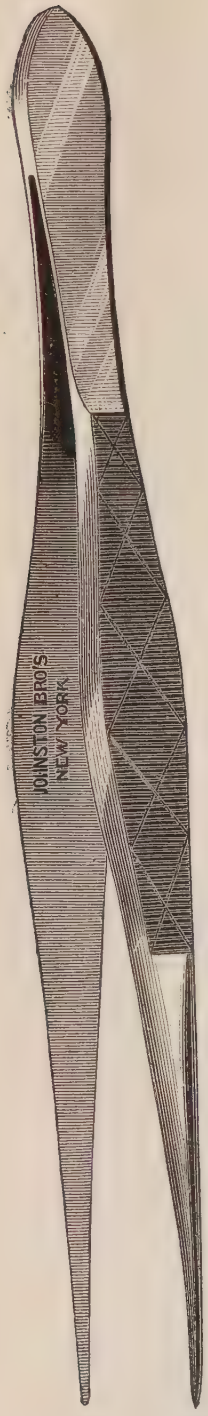


SUSPENSION DENTAL ENGINE.

(Dr. ELLIOTT'S INVENTION.)

Price, $50.00. Right Angle Attachment, $5.00. Boxing, $1.00.

FOIL TWEEZERS.



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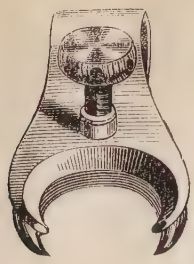

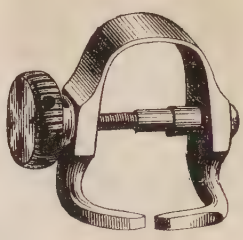

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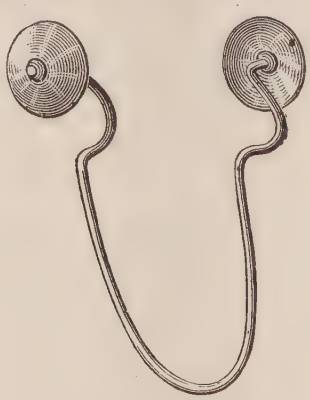

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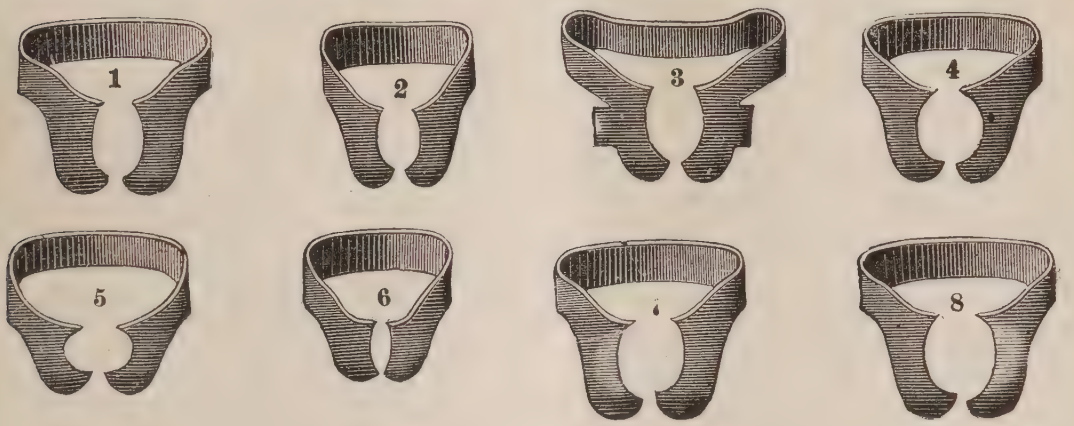

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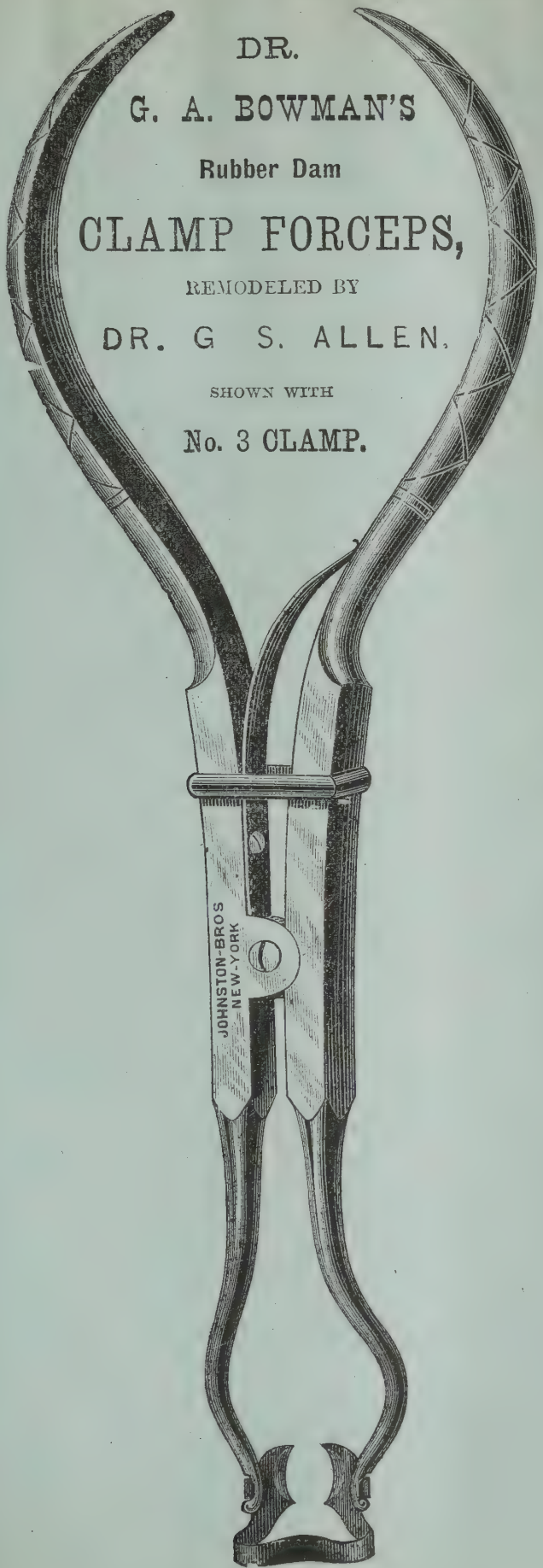

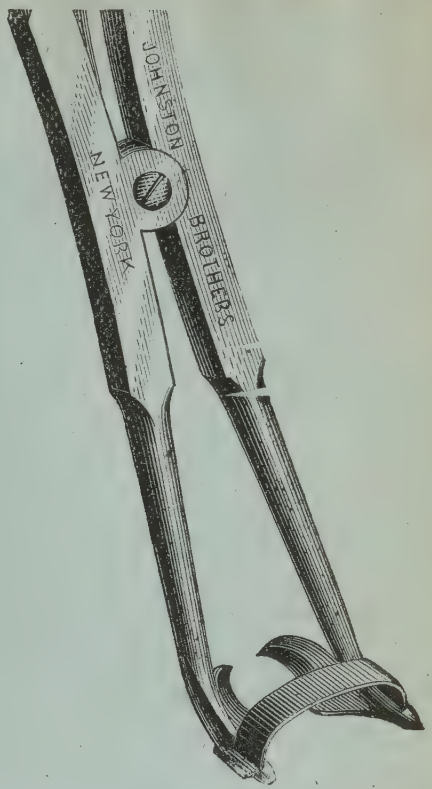

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AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL AND MECHANICAL LITERATURE.

APRIL, 1878.

NEW YORK:

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JOHNSTONS'

Dental Miscellany.

Vol. V.——*April, 1878*——No. 52.

"GOLD, A TEMPORARY STOPPING."

BY C. M. WRIGHT, BASIL, SWITZERLAND.

If we take a little block of chalk, such as our school-boys use for writing on black-boards, and chisel out a model of a molar tooth, and then, with our boring engine, cut out a cavity the *fac simile* of an approximate cavity of decay, such as we too often find in badly organized or badly neglected human molars—if we prepare mats or ribbons of "pure and therefore cohesive gold" foil, and with our index finger direct the armature of thunder and lightning till we have with this material and this regular force built up a gold filling to repair the loss and restore the contour of the model—we have done what we often do in our attempts to repair the ravages of decay in the human teeth. Now, if we place this chalk tooth with this jewel of a filling in it, under a glass shade and put in a safe place, the tooth and gold may remain as they are for say—one, two or more centuries. If we give the model, instead, to an ordinary child as a plaything, the probability is that in a few days or weeks the chalk will have been crushed and broken, and the gold will remain as it is in form and beauty and *permanency*, but it will no longer be a stopping for the cavity, excepting in the sense that a ground glass stopper is a stopper, even after the bottle is broken.

If we take a piece of rattan, such as Cincinnati teachers formerly employed to tickle the palms of unruly boys, and carve from the end a

model of a human tooth and then proceed as with the chalk model to excavate and fill with gold a cavity such as we are familiar with—and after that, place the rattan model in a glass of water, we may reasonably expect the inside surfaces of the gold to become moist, just as we do in vascular human teeth that we fill with gold. If fillings are intended to perfectly exclude moisture, we must make them in substances differing from tooth *tissue.* In both of these cases the filling may be *mechanically perfect*, notwithstanding Dr Webb's entire concurrence in his quotation in the January *Miscellany* from the "poet sculptor, W. W. Story." After reading Dr. Webb's replies and articles on the subject, I do not think a single reader of the *Miscellany* has changed his opinion in regard to the original proposition that "gold is a temporary stopping," excepting in cases where the teeth are of excellent quality, &c., &c., when it *may be considered permanent.* Dr. Webb has not stated what he means by permanent in regard to this subject. How long should a filling remain to be considered permanent? Will five, ten or twenty years do? Of course, to be as accurate in regards to words as the Doctor proposes when he emphasizes my use of the word *perfect*, none of the works of man are permanent, and the creations of God are undergoing constant change, and decay is the law of Nature. A permanent filling should require no "renewal," no "patching," no "guarding," no attention during the life of its possessor to be strictly a *permanent* filling, even in our limited though strict construction of a "permanent filling." If a gold filling is less than this, if it requires a patch in two years, or an addition in five years, or a renewal in ten years, it is in every sense a temporary filling. If a gold filling does not so conserve the part operated upon and the parts adjoining, that the tooth shall never be lost from a recurrence of the disease on this surface of the tooth, it is a temporary filling. Dentists have been taught to say gold is a permanent filling, and they have gone on day by day repeating the same old story—but we have been taught to *say* many other things that were not true. Law, Medicine, Theology, Art, Elocution, etc., are surrounded by traditions. Look at a mediocre Hamlet on the stage, and he bellows and creeps about like a snake, and saws the air with his arms, before a civilized audience of the 19th century, on the English or the German stage, because some old Master of Art did so before him; and it takes a Booth to correct the bad impressions of the past and present a better conception of the character. In Law, Medicine and Theology it requires a convulsion like an earthquake to evolve a truth and make a

worthless maxim a thing of history only. Liberal professions move in ruts—but few of the followers think independently. The traditions of the profession are like walls on each side of the highway, and only here and there does some bold traveller succeed in defying public opinion and in climbing the wall to view the broad landscape on the other side.

In our profession we are enjoying a season of earthquake—the house is being shaken by the boldly proclaimed creed of the "new departure." The storm had been brewing for a long time in the Odontological Society of New York, when Bogue, Palmer and others climbed the wall of tradition and boldly proclaimed what they saw. Low mutterings began to be heard from various quarters. Now the storm has come. It will pass away and the air will be purer. Dr. Webb's position will not be the "opinion of the future," for gold amalgam, tin, tin and gold, oxychloride of zinc, gutta percha, &c., will be regarded as *temporary stoppings* for carious teeth. It will be admitted that Dr. Webb's opinions that the "attainment of excellence in each and every case" should be the high object of the operator, and that *enthusiasm* for his art should be possessed by the dentist, are correct and noble ones.

Personally, I should be sorry not to be able to agree cordially with much that Dr. Webb has written, for the Art of Dentistry is the art that has absorbed my earnest thoughts from early manhood. It is my life, my very breath. The best hours and days of life are being devoted to it. No thoughts are so absorbing as those about dentistry. No book so interesting as one on this subject. No periodicals so eagerly waited for and so often re-read as those devoted to dental interests. No friend so agreeable as a brother dentist. The days are full of dentistry, and even the realm of dreams is invaded by it. It is a complete occupation. The keen point of wit, the distinct relish for the fine arts, the delicate edge of appreciation for poetry, literature, politics are blunted, because of the absorbing *one idea*, dentistry. I stand in the Gallery of the Louvre, and while gazing on the "Immaculate Conception," by Raphael, or on the works that have made Rubens and Murillo immortal—thoughts of dentistry come up. I visit the art founderies of Munich, and amidst the din and noise of the artizans, imagine the fellow who, with a file, is polishing a gigantic Pegasus to be like a dentist polishing a hugh gold filling. I look with surprised pleasure on the Lion of Thorwaldsen, at Lucerne, carved in the solid rock of a hillside, and note the ravages and stains of wind and weather, and wonder whether Dr. Webb would define this work as temporary or permanent. But in the presence of

the glorious works of these art masters—these artists,—I become modest and do not for a moment think of elevating my work side by side with theirs. The filling of teeth is a very absorbing occupation, but it is not a *fine art.* We are not artists in the higher sense of the word. We are, perhaps, more than artizans—but less than artists. Our monuments do not express any of the nobler sentiments of the human mind. Only our own craft really appreciate the work we do. We have no brotherhood with the painters and sculptors and architects of fame. In all our love for our profession—in all our enthusiasm—let us try to see ourselves as others see us. We are dentists. The Germans call us Zahnertzte—*i. e.*, tooth physcians, and I think that is about all we are. Let us be the best tooth physicians we can! Gold, therefore, like amalgam, or tin, or gutta percha, is only a *remedy* in the hands of the tooth physician. We are artizans in so far as as our remedies are mechanical ones and must be applied with skill. Our lives are spent, our energies and vitalities exhausted in saving or trying to save the *teeth* (not the souls) of our brother man.

It is a respecteble occupation for a portion of mankind, but let not the frog try to puff himself up to the size of the ox.

We may make, mechanically *perfect* fillings of gold, just as a mechanic may make a mechanically perfect steam joint in his engine, without being liable to the melancholly criticisms of art critics, about the imperfections of such works of art from the masters as this old country is full of.

Over here, in Switzerland, we have the softest variety of teeth to treat in a majority of cases, and if we should employ gold only, as a filling material, we should have to destroy pulps in great numbers, build gold halves and entire crowns upon roots in great numbers, and fill tortuous cavities under the margins of the gums, encircling the necks of bicuspids and molars, all at great pain and inconvenience to the patients and ourselves, and then explain that gold is a temporary filling, or we should certainly soon be *found out* and have to leave. Therefore the dentists of Switzerland employ gold, amalgam, tin, oxychloride of zinc, gutta percha and judgment in their remedial operations on the teeth. They use gold in cylinders, pellets, strips, balls, ribbons, mats, ropes, blocks, &c., &c. They use gold on the wedging system, and on the cohesive or building system. They employ automatic and engine mallets, and pretty Swiss girls as vital mallets, hand pressure, and all other well known methods. They have modern chairs, stools, dam-appliances.

engines, instruments, &c. And every American dentist in Switzerland, with whom I am acquainted, is an earnest and enthusiastic *dentist*, wide awake for the reception of valuable knowledge and new ideas, and devoted to the interests of his patients, to the extent of a gradual undermining of his own health. Can they do better as enthusiasts?

Personally, I employ the materials above mentioned and well known to the profession, without consulting the wishes of my patients; but if asked about materials I explain that gold is the favorite material of dentists on account of its beauty, purity and solidity, that a mouth looks cleaner and better where gold is used, &c., &c., but that unless the teeth are of excellent quality—hard and of a disposition ro resist certain kinds of decay—*all* materials are temporary in character. That while we (the dentists) give a few hours a year, and the patients a few minutes a day to the care of the teeth, the enemy, *Caries*, keeps his batteries and his acids constantly at work, night and day. I promise nothing but my best services, skill and advice. I present my bills for the *time* devoted to them and not for the operations.

When I wrote the first article entitled "Gold a Temporary Stopping," I believed what I wrote. When so well known a writer and operator as Dr. Marshall Webb "replied," I laid aside my belief and was ready to pull down the colors if he could prove my ground untenable. To-day, I am more firmly convinced than ever, because I have thought more on the subject, that "Gold is a (first-class) temporary stopping for carious teeth."

THE POISONS OF THE INTELLECT.

BY CHARLES RICHET, IN "REVUE DES DEUX MONDES."—1877.

(Translated by PROF. THOS. H. CHANDLER, *Boston.)*

Continued from page 96.

There is a certain class of people whose intellectual temperament is delicate and excitable. These are the nervous temperaments, but not exactly in the sense generally understood; they are nervous as regards the brain. The least event destroys with them the balance of reason. The slightest emotion, the most unimportant *contre-temps* takes from them immediately their presence of mind and coolness. When they are in their normal condition they want neither judgment nor will, but

should any sudden accident occur, all at once disappear, judgment, will, reflection, and the disturbance of the intellectual faculties equals that produced by drunkenness. With such persons the slightest access of fever brings on at once delirium and hyperideation. They are weak-headed, to use a common expression, and if they are not very careful of themselves they are made tipsy without suspecting it, with a deplorable facility that has played them more than one unlucky turn. This predisposition may reasonably be compared to the nervous state so often found among women and known as hysteria. Now women, and especially the hysterical, become intoxicated with great readiness. The slightest dose of alcohol is enough to cause loss of their reason. This is because, with the hysterical as with the predisposed, the will and the attention are weak, and but a very slight cause is required to make them disappear altogether.

Besides the individual predisposition, there are still other conditions of which great account should be made, as well for the different kinds of intoxication, as for the rapidity with which ebriety appears.

The intoxication of brandy and other liquors heavily charged with alcohol is heavy and stupid ; it scarcely produces intellectual excitation, and seems from the very first to act upon the organic functions, the circulation and the respiration. On the contrary the intoxication produced by wine is light and stimulant, especially that of the wines of Champagne, and of Burgundy, which manifest themselves chiefly in psychical effects. Finally the mixture of liquors of various natures acts with great intensity. The rapidity and facility with which alcohol is absorbed are also not without their influence. Thus, when one is fasting alcohol acts very rapidly; on the other hand, taken with a full meal it is absorbed more slowly, and the toxic effects are less to be feared. In England where alcoholism rages even in the highest classes of society, a singular custom has been adopted which enables the drinking of large amounts without danger of intoxication, this is to take at the beginning of the meal a glass of oil, which hinders the absorption of the alcohol into the tissues of the stomach and intestines. This disgusting custom was formerly much in use; I know not if it still exists.

The outside temperature also is not without its action. I remember that when I was in Egypt, in the month of September, under a torrid heat, a half a glass of wine of Bordeaux mixed with water was enough to confuse my faculties, and that, if I had not been very careful, if I had continued to drink even the weakest dilution, the consequences might

have been disagreeable. This exaggerated power of the wine may perhaps be due to the rapidity with which alcohol volatilizes at a temperature of 104 degrees Fahrenheit, but this explanation is not very satisfactory, for whatever the exterior temperature, that of the blood remains practically invariable. The effects of sudden exposure to cold are also noticeable. Thus, a man leaving the table only slightly overcome, exposed suddenly to a freezing atmosphere, may all at once experience the effects of intoxication. It may be that this immediate action of alcohol is due to the sudden suppression of the perspiration of the alcohol by way of the skin and the lungs. This is why, as Doctor Burill has remarked, the monks of Mount St. Bernard give only coffee to travellers.

From all that we have said, we may conclude that alcohol in small doses super-excites certain intellectual faculties, the imagination, the memory, the association of ideas, but that it paralyzes others, especially the will, the reflection and the judgment. Yet, with a stronger dose all trace of intelligence disappears. When old Sly is stretched on the ground dead-drunk and snoring in the mud, he excites compassion and disgust.

> "O monstrous beast! how like a swine he lies!
> Grim death, how foul and loathsome is thine image!"

To the exaltation has succeeded a profound depression, a true *coma*, to use the technical term. The insensibility is complete, no external irritation can awake the unfortunate who is dead drunk. In this state painless operations have been performed just as with chloroform, and Montaigne tells stories on this subject too "fishy" to be recorded here. This period of complete anæsthesia is far from being safe, and not infreqently cases of death have been reported in the comatose state of intoxication.

It is in this way that the phenomena succeed one another in most individuals; but with some, between the comatose period and that of excitation there is often a serious condition which the ancient authors have called convulsive intoxication.

Says Percy: "Ten men can scarcely master a mad man of this kind. His look is fierce, his eyes glare, his hair bristles, his gestures are threatening; he grinds his teeth; spits in the faces of the bystanders, and, what renders the picture still more hideous, tries to bite all who come near him, fastens his nails upon everything, lacerates his own flesh, if his hands are free; burrows in the earth, if he can escape, all

the while giving vent to horrible howlings." To this terrible period of drunkennesss are to be referred the crimes and murders committed by drunkards. Those afflicted with this kind of intoxication are as little responsible for their acts as lunatics, and the delirium Percy has so forcibly described is precisely like the delirium of maniacs. This form of intoxication is rarely met with except among those unfortunates whose blood has been vitiated by previous alcoholic excesses, and it is one of the peculiarities of alcoholism the most to be feared that this furious delirium comes after a new excess of drinking, even if this excess is slight in comparison with those that have gone before it.

In truth the effect of the action of alcohol is not solely a rapid intoxication of short duration; it may, if the use or the abuse of it is prolonged over a length of time, become a chronic intoxication profoundly disturbing all the functions of our organs, and ends by altering all the tissues. The nervous system is perhaps altered more than any other, and particularly the encephalon. Accurate experiments upon animals whose food has been mixed with alcohol, have shown that a certain quantity of this substance is absorbed by the brain, in accordance with the elective affinity certain tissues have for certain determinate poisons, so that it is possible, after having killed the dogs thus made drunken, to take their brains, and by distillation recover therefrom a portion of the alcohol. If the experiment is continued over a longer time, these unlucky dogs, involuntary victims of drunkenness, come at length to lose their intelligence; they become restless, sad, agitated. According to M. Magnau, they have real hallucinations; at times they think they are pursued, and run away terrified, howling and snapping at the air. At other times, in the middle of the night, they groan plaintively and tremble in all their members, as if they saw before them terrible phantoms.

This sadness and fear are also in man the results of chronic poisoning of the intellect by alcohol. It seems as though, by a sort of legitimate vengeance, nature caused the expiation of the joys of intoxication by the terrors of alcoholism. At first there is only a vague feeling of indefinable sadness, which is sought to be combatted by new doses of the poison. Little by little this sadness increases at night, at that time between sleeping and waking, when we are not quite asleep, but yet are not wholly awake; visions are seen dimly, but always of horrible shapes. These are not yet true hallucinations; they are illusions only; but the time of hallucinations comes: hideous forms, obscene beasts, or else terrifying objects borrowed from the domain of real life. We can obtain

no better idea of this form of delirium than by reading the medical observations referring to the insane from alcohol. It will suffice for me to cite a single one, borrowed from M. Magnau. As all the observations have a general resemblance, from this one example a judgment can be formed of the most frequent form of alcoholic delirium. He speaks of a woman of forty-five, who has been drinking for a long time: "The light put out, along with the darkness come again the hallucinations; she tries at first to fix her attention upon other objects; she closes her eyes and endeavors to sleep. It is in vain. All at once she hears the voice of her parents, the groaning and crying of her daughter, who is being dragged away. * * * * * She sees spiders' webs upon the wall, ropes, nettings with meshes which open and close; in the midst appear black balls that swell up and contract, take the form of rats, of cats which pass through the nettings, leap upon the bed and disappear. Then she sees birds, grinning faces, apes that run, draw near, enter the wall; chickens that fly away and she seeks to catch: on the roofs of the neighboring houses are seen men armed with guns; through a hole in the wall she sees the barrel of a revolver aimed at her; fires on all sides; houses falling in; then all disappears. In the midst of the tumult she beholds her husband and children whom they are putting to death, who cry fire! murder! help! She hears bells, music, the noise of machinery in the next room, then songs—confused shouts. The trees seem to dance, and are covered with globes of all colors, which retire, increase, and diminish; at intervals immense fires of many colors light up the horizon."

Often these hallucinations are so dreadful that they compel, so to speak, the unfortunate to take his own life. Nothing is more common than the suicide of drinkers.

According to Brierre de Boismont, in a total of 4,595 cases of suicide there were 530 from drunkenness, or about one-ninth, a very large proportion, and one of the grave social consequences of the abuse of alcoholic drinks.

These deadly effects of alcohol are well known. How, then, does it happen that everywhere, under all climates and at every epoch, man has shown such a fondness for this poison? He is, perhaps, the only animal that has a passion for strong drink. Rare cases are sometimes cited of monkeys or dogs which consent to drink mixtures charged with alcohol, and sometimes find a pleasure in it, whilst for man the pleasure is general, and admits hardly an exception. It is because man is unhappy

and seeks to forget. The reality of life is often cruel, saddened by labors, cares, disappointments. Sometimes the workmen of our large cities, exhausted by wretchedness and employed in the roughest labors, sometimes the dwellers in the cold fogs of Norway or the icy steppes of Russia, sometimes unfortunate savages of feeble intelligence, striving against hunger and bent beneath the crushing yoke of a despot, all miserable, oppressed, bowing the head to destiny. They have, nevertheless, the means of sustaining this servitude. A few drops of this cordial drives away all shadows. Misery, hunger, and cold will have disappeared ; they will feel themselves strong and powerful ; the sufferings of yesterday will have been forgotten ; those of the morrow they will think of them no more, and, with the alcohol, which makes them brutal, they will seem to pour into their veins health and happiness.*

It is also in poor countries and in cold climates, where poverty is so cruel, that alcoholism makes the greatest ravages. In England, for example. There drunkenness has become a social scourge.

In one million poor, succored by public charity, there were, in 1865, eight hundred thousand drunkards. The drinks which serve for daily consumption are chiefly *Whiskey* and *Gin.* Whiskey is the product of the distillation of wheat or rye fermented. Gin is obtained from the liquor of grain distilled over the berries of the juniper. Added to these are the wines of France and Spain, for the most part adulterated, *Porter*, *Ale* and *Stout*, beers very rich in alcohol.

In the United States, where the taste for alcohol is not less than in England, besides *Whiskey* and *Gin*, they drink Brandy, produced by the fermentation of potatoes colored with caramel, *Rum* and *Rum-arrack*, which is got by the fermentation of molasses. In Sweden alcoholism makes great ravages. According to statistics, each inhabitant, excepting women and children, consumes about one hundred litres of alcohol a year.†

In the villages on a Sunday it is rare to meet a man who is not intoxicated. Yet the Swedes are a laborious, intelligent peo-

* Quite recently, in a book very strange in all respects, in the *Assommoir* of M. Zola, the effects of alcohol have been described with exactness. The evils it engenders are represented in all their cynical horror; misery, prostitution, debauch, crime, even; such are the fatal consequences of alchoholism and drunkenness. Yet the book of M Zola is not an immoral book, and if the grossness of the language did not hide with a dense cloud the talent of the author, I should be almost tempted to call it a moral work.

† A litre is one and three-quarter pints, so that 100 litres would be about 22 gallons.

ple, and one of the most honest in Europe. In Russia the consumption of alcohol is enormous, and, unfortunately is encouraged by the farmers of the tax. Besides the liquors from grain, such as *Vodki* and *Kummel*, there are other alcoholic drinks in common use, such as *brega* or white beer, *symorosli* or wine of the birch, produced by the fermentation of the sap of the birch tree.

The eastern Tartars drink fermented mare's milk, a very alcoholic liquor, known by the name of *koumiss*. On the other hand, in temperate climates, and in the south of Europe, drunkenness is a rare vice.

The Spaniards are proverbial for sobriety. The Greeks, the Italians, the Turks b:t very rarely give way to excessive drink. In France, happily, alcoholism is not common; very rare in the south of France, it is more common in the north of France, notably in Brittany, Normandy and Flanders. In fine excessive drinking kills every year an average of 50,000 persons in England, 40,000 in Germany, 25,000 in Russia, 4,000 in Belgium, and only 2,000 in France.

People reduced to servitude, or who have emigrated to sustain existence, are rarely sober; they drink to forget their ills. The Irish and the Poles are in this case, and, of all the European people, these are perhaps, the most addicted to drunkenness. In Asia the Chinese are generally sober at home, but when they emigrate, whether to the United States to Cochin China, to India, or to any of the islands of Eastern Asia, they become passionate drinkers, and use either brandy from rice, or the liquors from the grains, which the Anglo-Saxons, caring little for the morality of it, sell at a low price.

It is curious to see to what point the savage peoples in contact with European civilization, have immediately borrowed from it whatever it has that is most pernicious, especially the use of spirituous liquors.

In America the Sioux Indians, in Australia the wretched tribes in the interior, consume enormous quantities of *fire-water*. The evil makes among them frightful progress, so that these people will soon have disappeared before their invaders. Especially on the coasts of Africa, in Guinea, at the Congo, at the Cape, in Abyssinia, the European factories sell to the natives strong liquors which ravage their tribes. Brandy from the millet, from honey, the wines from the palm tree, from dates and the banana do not suffice them; they must have our liquors made from grain. Those infant peoples, who know neither to moderate their desires, nor to master their passions, become intoxicated with eagerness, and are not satisfied till they fall dead drunk.

According to M. Picqué, the Tahitans were almost entirely ignorant of alcoholic liquors, but the Europeans in 1796, having taught them to ferment the fruits of their country, they acquired a raging passion for the frightful drunkenness which these liquors produce. Henceforward they fermented the juice of the orange, the apple, the pine-apple, and a multitude of other fruits.

M. Picqué also mentions the example of the Lapps of Finland who do not understand the art of distillation; but when they come down to the coasts the first thing they ask of the sailors is brandy; they pick them up dead drunk on every creek along the shore.

Among the numerous alcoholic drinks used by man to pervert his intelligence we have not mentioned *absinthe*, because this does not act alone by the alcohol it contains, but also by the essence of absinthe which, even in a minute dose, is a fearful poison. That which differentiates absinthe from alcohol, is that instead of acting solely on the encephalic nervous system, it acts also with immense rapidity upon the spinal marrow, producing tremblings, epileptiform convulsive attacks, and, at last, attacks of epilepsy. It nevertheless appears also to produce a sort of special drunkenness, the same feeling of satisfaction, of comfort as alcohol, and the beatific effects and the hyperideation are more marked with it than with alcohol. Perhaps the sensation of warmth and comfort caused by absinthe may be attributed to its action on the spinal cord, but at any rate it is an energetic poison, whose prolonged effects become deadly to the intelligence much more rapidly than do those of alcohol, as the patient investigations of M. Magnau have shown. Absinthe should be absolutely excluded from public alimentation, whilst we could not dream of doing this for alcohol. Alcohol is an excellent stimulant, which in a moderate dose, is agreeable and even useful. It is a reparative aliment; more, it is a tonic medicament, whose efficacy is incontestable; but what slight advantages when placed by the side of its evils!

THE "COSMOS" RAMPANT.

(*From Canada Journal of Dental Science.*)

In noticing the first number of a new journal, which, while being the organ of a dental college claimed to be "independent," we ventured the assertion in our last number, that this unpretentious Canadian bantling

"is the only independent journal on the continent.." The continent is a big one—this claim is a big *fact.*

The Cosmos, in its December number, takes this up as a sort of personal insult, though we did not mention that journal at all, and bravely claims to be the very quintessence of "indepencence," from first to last; while it insinuates that an editorial paragraph of our own, which drew attention to "our advertisers," and which we repeat in this issue, "may be the result of influence—may not be inserted in compliment to advertisers—may be paid for directly or indirectly," It points "with satisfaction"—*to itself*—"to the" absence from its pages of unseemly *puffs of special manufactures,* of which the pages of other and *so-called* independent journals are *embellished. We have not,* as those familiar with the *Cosmos* are aware, *allowed its pages to be prostituted to encomiums or testimonials of its publishers' manufactures, nor those of any other manufacturer or dealer."* It wonders "why a journal should be more independent if published by a dentist than by a (dental) dealer or manufacturer." Its remarks are evidently largely influenced by the article, "Plain Words for Dental Manufacturers," in our last number, in which it seems to have found several caps to fit its head.

When we claimed this journal as "the only independent dental journal on the continent," we made no insinuation that the editors of our contemporaries were under the undue influence of the proprietors. We stated a fact and left the reasons of it to be surmised. We did decidedly mean that the Cosmos, as well as older and younger journals, were not independent, inasmuch as they were used month after month as the vehicle to puff and praise the special interests of their proprietors, being dental manufacturers. No impartial reader of the Cosmos, for instance, will pretend to say that the advertising interest of its proprietor is not closely bound up with the part "devoted to the interests of the profession," and that a monthly journal of 106 pages, *fifty of which are devoted to the loudest advertising of its proprietor* is independent in the true sense of the word. We scarcely think that even the Cosmos will pretend to say that it would have an existence at all were it not for the monthly monopoly it secures itself of advertising the business interests of its proprietor. Has not the proprietor acknowledged that it does not pay, except indirectly—that its subscriptions have never paid its expenses? Does this show independence or not? Now, we mean to say that a journal independent of any one manufacturer would pay, because every manufacturer could advertise in it and every depot would have an interest

in pushing it. As it is now, no other depot will push a journal which is used by a monopoly like the Cosmos. As we said in our last issue, however, the fact that the proprietors use their journals as advertising mediums and monopolies is no complaint against the proprietors. It pays. They have a right to use their journals and the profession as best they can to promote their business interests. We do not presume to dictate to these gentlemen how they shall conduct journals ostensibly "devoted to the interests of the profession." What we do propose, and wish earnestly to see, is a dental journal in the United States, under the wing of no dental manufacturer or college, but independent, *pur et simple*, of any one business interest it can be used to advertise.

We dislike to measure swords with our contemporary on this point, not because it has the advantage of a more frequent issue, but because we are willing to admit, that in making a fortune out of the profession in a short time, its proprietor has honored it and himself. We do not say that everything he has done through the Cosmos has been from purely selfish business motives, or that he is illiberal, a monopolist, and does not want to live and let live. We do most emphatically say, however, that, from its first to its last number, the Cosmos has forced the fact upon its readers, in its fifty pages of advertisements, that while one-half of it is "devoted to the interests of the profession," the other half is, with the exception of a few other advertisements, devoted *entirely* to the business interest of its proprietor—a dental manufacturer. We dare to believe that if its proprietor could not use the Cosmos "devoted to the interests of the profession" in this way, that journal would have no existence. We fail to see any liberality in opening its columns to ordinary communications and gathering about it a host of correspondents and friends, *every one of whom can become a customer.*

To refer *en passant*, to the claim that the Canada Journal is the only independent dental journal on the continent. In the sense in which we meant it, and as clearly expressed it, this *Journal* is the only one on the continent not published by a dental manufacturer or college, and used for a special business interest. The American Journal of Dental Science an old-tried solid friend, is the advertising organ of its publishers, Snowden & Cowman, *Dental Depot*, and of the Baltimore College of Dental Surgery. The Register is the advertising organ of its publishers, Spencer and Crocker, *Dental Depot.* Johnston's Miscellany is the advertising organ of Johnston Bros., *Dental Depot;* the Dental Office and Laboratory of Johnson & Lund, *Dental Depot;* the Dental Advertiser, of the

Buffalo *Dental Manufacturing Company;* the Cosmos, of S. S. White, *Dental Depot;* while the Missouri Journal is the zealous organ of the Missouri Dental College, and the property of A. M. Leslie & Co., *Dental Depot;* and the St. Louis Quarterly of the Western College of Dental Surgeons. And, as if to add further proof to our statements, the last number of the Missouri Journal announces that its publication is to be resumed by A. M. Leslie & Co., *Dental Depot*, and the new venture, the *Dental and Oral Science Magazine*, though the organ of the New York Odontological Society, is issued by R. J. Williams, *Dental Depot.* There is only another left, and it is not our fault if this Canadian Journal is really the only one on the continent independent" of any such business interest, which boosts up and advertises the others. It is a fact, nevertheless, and "the more's the pity."

The editor of this Journal is its sole proprietor. He makes no use of it to promote his private interests by sending it to the newspapers for review—a custom common with every medical and law journal in the country. He has no interest of any kind in any dental depot, and is just as free to say a good word editorially for the proprietor of the Cosmos, and anything good he introduces, as he has often done, as he is free to criticise any humbug or to do justice to any rival. The insinuation that the request to deal with our advertisers *generally* is a "paid puff" is as silly as it is untrue.

An "independent" journal, appearing monthly, ought to let its subscribers know the best everywhere; its selections ought to be *cosmical;* the good in other Nazareths ought to be prominently noticed. Of late years the Cosmos has narrowed this rule more than ever. It is a *Cosmos* so far as the business interests of its proprietor is concerned, but it is not *Cosmos* in the true interests of the profession. Our own journal never made any pretentions to fill the space lacking. It is doing its best. Its rivals in the United States have greater scope for broader work.

The very fact that the Cosmos is owned and published by a dental manufacturer, who controls not only its advertising space, but who apparently influences its "selections" is proof positive that it cannot be independent. Each number contains 50 pages of advertisements, forty at least of which are exclusively devoted to the most fulsome puffing of the business interests of its proprietor.

An independent journal ought to be free in its advertising columns to every dental manufacturer who has goods to advertise, which he thinks the profession ought to know about. *The Cosmos has rejected the adver-*

tisements of several leading rival depots at any price. It is certainly independent enough to prevent competitors making known their interests to the profession through its pages.

It is rather amusing at best to read the boast in one breath that our enterprising contemporary has not "prostituted its pages to encomiums or testimonials of its publisher's manufactures," and then to turn over further to the fifty pages of its advertisements in the very same number, where the first page advertises an article "superior to all others;" the second, a material "the best of its kind," with two "testimonials;" the third, another advertisement puffed with two more "testimonials;" the fifth, more "testimonials," and so on, until the flood of "encomiums and testimonials" about a chair manufactured by the proprietor, culminates in a deluge of no less than thirteen "testimonials." And this is the Journal whose pages have never contained "unseemly puffs of special manufacturers" or "allowed its pages to be prostituted to encomiums or testimonials of its publishers' manufactures." It is a very convenient arrangement which, Janus-like, can devote itself "to the interests of the profession" ostensibly, and to those of its proprietor actually. It is scarcely likely that the profession generally will admit that the two are one—that the private business of the proprietor are so interwoven with *our interests* that they must be as coupled and inseparable as the swans of Juno.

In one point of a paragraph we agree. It is so self-evident. "Nor those of any other manufacturer or dealer." The simplicity of this is refreshing.

Has nothing good and even great been brought out by rival depots? Where in the "independent" Cosmos is the profession to find justice done to the enterprise of Johnston Bros. for first introducing liquified nitrous oxide to the profession of the United States and Canada? Why was the independent Cosmos so long silent about this valuable introduction? It was used in Europe over two years before it was even noticed in our contemporary. Where is the profession to look in the Cosmos for fair notice of the dental engines, brackets, etc., introduced by other *dealers*—not by private persons—before its proprietor brought copies out? When Johnston Bros. introduced the dental engine the Cosmos proprietor cast a slur upon it and called it "the kicking engine." Where does our independent friend do justice to the merits and superiority of Justi's teeth? We know where to look in the Cosmos for "unseemly detraction" of other makers' wares; we can point out where the

proprietor uses his Journal monthly to depreciate and decry the honest claims of his rivals, and to satiate his readers with sickening puffs of his own manufactures. The March number contains twenty seven pages of a plea in defence of its infringement of Johnston Bros. patent of liquefied nitrous oxide—a bold-faced infringement, unblushingly defended, with much personal bullying and abuse. The Cosmos is the very last dental journal which can lay claim to honest independence in the sense in which we clearly expressed it. The profession could not find in the "independent" Cosmos any allusion to Williams' special forms of gold *until they were copied by the Cosmos proprietor*. The same can be said of engines, brackets, the moveable back of an operating chair, all of which the Cosmos proprietor copied from other makers. With the exception of the electric mallet, he has not introduced one of the late leading improvements. It may be said that the Cosmos could not be expected to advertise other depots at the expense of the proprietor of the Cosmos. Yes, it should ; or at least, an "independent" journal should.

What we want as a profession is an untrammeled Journal—one as independent of the proprietor of the Cosmos as of the proprietor of any other dental depot, or of any college interest. The medical and legal professions have such periodicals. Why not the dental profession ? We should be glad to see such a reformation in dental literature across the lines, and urge our brethren *to dare to speak out.* If they prefer to hang by the skirts of any manufacturing monopoly the worse for themselves. It is only a duty to themselves to possess journals perfectly independent, published by no manufacturing or college interest. We are confident it will come in time.

RELATION OF THEORY TO PRACTICE.

Read before the Alumni Association of the Philadelphia Dental College, Feb. 27, 1878,
By C. L. ANDERSON, D. D. S., Springfield, Mass.

In the few moments allotted me we cannot take the comprehensive view of the subject we should like to, but ask your consideration of a few desultory thoughts.

The practitioners of Dentistry and Medicine may be divided into three classes, viz.: Those who are for the most part theoretical, those

who are intensely practical, and the favored few who combine both of these necessary elements in a happy manner.

Theory is a plural term—for it may indicate an hypothesis, *or* a phylosophical exposition of facts; it may be conjecture or it may be a scientific arrangement of phenomena.

Facts are certainties,—things which are axiomatic,—and are either the foundation of theories, or the incentive to their building.

Practice is the exercise of art, or the application of science to the wants of our fellowmen; and this involves, if the practice is commendable, the use of our knowledge of facts with the deductions or the theoretical which may be complemental to them.

And now, the question naturally arises, how shall I *know*, what to combine and how much, to form a practice whose chemistry shall be perfect? This inquiry, which has come home to some of us with a very practical force, and which to others here will soon appeal as strongly, we can only partially answer, and thus leave each one to exercise his own powers to work out this life-problem

In the first place, it is a good thing to always do "that which our hands find to do;" in other words, when a case presents, rather than stand theorizing as to the probable or possible results, take the *first* step, and by keeping in mind that everything has an order which must be preserved to produce the best results, we may save ourselves much needless anxiety,—for difficult cavities will become simple, in treatment obstinate lesions more tractable, and occult causes more easily diagnosed. Every geometrical figure, even a circle, is but a succession of straight lines, and so in life, if but rightly viewed, the path to success as well as duty is as direct as the shortest line between two points. Get perfect impressions, cut away frail edges, clear away the debris, *assist* nature, and many a problem will be at once reduced to its lowest and simplest terms, which, taken in the aggregate, seemed unsolvable.

Theory is the forerunner of fact and practice, and our knowledge of the *technique* and theories, with our ability to expound and propound them, determine to a great extent our standing among our professional brethren; but with our patients, and the community at large, *practicality* is the ensign which floats o'er the ship to which they look for aid. When they present in pain they care very little what occasions the trouble, but *do* care about ridding themselves of it, and the man who accomplishes this the easiest and with the least delay, merits and receives their gratitude, and adds another to those who shall spread his name and extend his reputation.

The man whose professional knowledge and skill is built upon the shifting sands of theory, and who implicitly and literally believes *every* tooth can be saved, will some day find that the gale has swept by and so covered and blinded him with his theories, that before he has recovered sufficiently to see a simple fact, he has saved a tooth and ruined a jaw. Take for example this case: A lady presents, whose age, height, complexion, temperament, etc., we do not in this case notice, for reasons which will be apparent, but we do note a darkened left superior lateral incisor, very sore to the touch, which irritation was increased or lessened according to the state of the atmosphere. As we save all teeth, and the others in the mouth are in excellent condition, we "prepare to do our worst" for this tooth, and succeed. After a few days treatment, the oral dome has swelled considerable, much pain is experienced, and pus is formed which is evacuated, but a recurrence of the same symptoms soon after, with the desire of the patient compel the extraction of the tooth, which reveals it badly necrossed at the apex, denuded of its periosteum, and the maxilla itself carious to a slight degree. Much pain, and damage to surrounding tissues would have been avoided if the fact that the tooth had been diseased for years, had been duly weighed with other considerations, and his practical knowledge taught him, that a pulpless tooth which has been a source of annoyance for so long a time, had much better be severely let alone, or if apprehensive of further trouble, extracted, than endeavor to mollify the effect until the cause is removed. So much for this phase of the subject.

In perusing the reports of national and local dental associations, we all must have observed what a seeming paradox their discussions produce, and, perhaps, as often asked ourselves the question, why is this? when we know that the statements made so much at variance are the results of the ripe experience of practitioners of acknowledged skill and veracity. For this, there are several reasons: want of judgment, sometimes due to the blindness caused by mistaken zeal, a non-appreciation of the fact that there is such a term as idiosyncrasy, the great attraction that the *new* presents to men, and the inability to succeed with the old, are some of the motives that induce so many practitioners to sneeze, when a few really reliable, but oft time self-appointed leaders take snuff. And it is between this party—the leaders and the led—and the minority who remember the much-quoted but very expressive couplet:

"Be not the first by whom the new is tried,
Nor yet the last to lay the old aside,"

that the cases are argued, and the verdicts obtained which both sides claim, but which only the jury of time awards.

At present, as the result of the agitation of the last few years, there has arisen, phœnix-like, from the ashes of extinguished theories, the so-called "new departure," and the dental profession, as a mass, stands in uncertainty which way to turn to find a method of saving teeth ; for while one side hurl the strongest invectives against the use of gold as a savior of teeth, the others are as strong in their denunciations of the new doctrine. Satisfying ourselves with the assertion that we believe there is an element of truth in both theories, we take the opportunity to make a plea for the more general use of non-cohesive gold. Leaving the merits and demerits of the discussion to others, let us notice one or two facts. *All* will acknowledge that the filling material which has stood the test of time is non-cohesive gold, then why not use it? It makes a beautiful filling when properly manipulated, is a great saver of time, expense and annoyance, and thus puts superior filling material on a basis to compete with even amalgam in a monetary point of view. But yet, our argument for its use is based on its ability to preserve, so to speak, which should be the test of all filling materials, and not its cheapness in dollars and cents.

The cry raised against gold, has resulted from the indiscriminate use of it in the cohesive form; and from the records of the past, theorize as you will, this lesson is clearly taught, that all single and parts of compound cavities should be filled with non-cohesive gold, and that the use of it in the cohesive form should be limited to the restoration of contour, and to afford additional strength in exceptional cases.

Plastic materials cannot show as good a record as non-cohesive foil, and therefore, the excuse for their general use posterially to the canines, is inability to manipulate foil ; but if the skill to put in gold is wanting, rather than cling dogmatically even to this, consulting the good of our patients, for which all our efforts should contribute, and not to our ideas or notions, use plastic materials, but *generally* speaking, he who lacks the skill to put in a good gold plug, is *usually* unable to produce good results with anything.

The use of plastic materials in their present form, is best restricted to frail teeth, dead teeth, restoration of crowns to roots, in cavities which cannot be *properly* filled with gold (for there are some such), and to a certain class of white, chalky teeth, in which filling materials which have the least conductibility, "last" the longest.

Having thus viewed our subject in these several phases, we draw a few conclusions.

Theory is not to be disregarded but held in abeyance to facts, that we may exhibit in practice, a practicality and knowledge of facts that shall result in the highest welfare of our patients and our reputation.

And on the other hand, unless we have the essence of theory, while our diagnosis may be correct, often a successful prognosis will need the application of theory, or the knowledge of the effects produced by certain combinations of causes, to produce the best results. And that however tempting, a professional reputation gained by building theories may be, the good we do to those with whom we come in contact, will determine our true position. The discovery of a fact, or the exhibition of a principle, things which endure, leaves from the tree of knowledge, forms a wreath much more to be sought for than the glittering but perishable crown which soon follows in the way of crumbling theories whose building it marks.

INTRODUCTION TO A COURSE OF LECTURES ON THE ELEMENTS OF DENTAL MATERIA MEDICA AND THERAPUETICS.

BY JAMES STOCKEN, L. D. S., R. C. S.

Dental Surgeon to the National Dental Hospital.

[Continued from page 117.]

4.—As a Separate and Independent Science :

Egypt must be regarded as the birthplace of the arts and scienees of civilized life, and here the practice of medicine advanced so far as to become a distinct profession. Heredotus informs us that the profession of medicine was hereditary, and that each practitioner confined himself to the treatment of certain diseases, or, in other words, they were specialists—an evidence of great advancement in medical science.

If Egypt was the birthplace, Greece may be said to have been the cradle of the sciences. It was from this favored and celebrated country that the nations of modern Europe first derived their science and their philosophy.

More than 300 years before Christ, the political power of Athens had begun to decline, and Alexander the Great had built the city of Alexan-

dria as the Greek capital of Egypt. His successors, the Ptolomies, continued to embellish the city and established the celebrated Alexandrian Library, which was said at one time to contain 700,000 volumes.

The encouragement which these Greco-Egyptian kings gave to the arts and sciences rendered the city the resort of the learned from all parts, and soon made its school and its philosophers the most celebrated in the world.

Two important steps were made in the Alexandrian School towards perfecting medical science. The first consisted in the introduction of the dissection of the human body, and the second in the division of the medical profession into three classes of practitioners, corresponding to the physician, the surgeon, and the general practitioner of the present day.

Before quitting this portion of the subject, it is necesssary to refer to the writings of Galen and Celsus. Although neither of these celebrated men became founders of a special school of medicine, yet they have exercised greater influence over the progress of medical science than any of their contemporaries or of their predecessors, with the exception of Hippocrates, whose works contain the fullest account which we possess of the state of medicine and surgery at that time. Galen, who was born 130 A. D., advanced the knowledge of the anatomy of the human body far beyond what was previously known. Although professing to belong to no sect, he was essentially a follower of Hippocrates, maintaining the same views with regard to the four elements, (*fire, earth, air and water*), the four fluids of the body (*the blood, the bile, black bile, and phlegm*), and the four conditions of *hot, cold, dry and moist.* He conceived that the properties of all medicines are derived from what he calls their elementary or cardinal qualities—HEAT, COLD, MOISTURE and DRYNESS. Each of these qualities he again subdivided into four degrees, and a plant or medicine, according to his notion, was cold or hot, in the 1st, 2d, 3d or 4th gradation. If the disease be hot, or cold, or any of these four stages, a medicine possessed of a contrary quality, and in the same proportionate degree of elementary heat or cold must be prescribed. Until a comparatively recent period medical writers spoke of the *four* greater and lesser *hot* and *cold* seeds; and in the London Dispensatory of 1721 we find the powders of *hot* and *cold* precious stones, and those of the hot and cold compound powders of pearl. Galen asserted that opium was cold in the fourth degree, and must, therefore, require some corresponding hot medicine to moderate its frigidity. This theory was still cherished in

the preservation of the formula for Pilula Opiatæ in the Edinburgh Pharmacopœia as late as the year 1803.

In the Pharmacopœia Londinensis of 1702, it is stated that every herb possesses in a certain degree one or more of these qualities.

Dr. Salmon, who translated it, admits that he has doubts concerning opium, as to whether it were hot or cold, as the ancients say one thing and the moderns another. In the year 610 Mahomet proclaimed himself the prophet of the Almighty, and became the founder of the Mahommedan religion; he enjoined his followers to propagate his doctrines by the edge of the sword, and this command led to a series of wars. Only eight years after his death the city of Alexandria was conquered, and the celebrated library almost entirely destroyed. Among the works which escaped were those of Galen and Hippocrates; these were translated by the Arabian physicians as the highest authority in medical science. During the existence of the Saracenic Empire an Arabian School of Medicine gradually sprung up; its physicians were held in great esteem throughout the world from the ninth to the twelfth century.

The real benefits which the Arabian physicians bestowed upon medicine consisted in their having preserved and translated the writings of the Greeks, in introducing many new and valuable remedies *indigenous* to the East—such as rhubarb, tamarinds, cassia, manna, senna, camphor, &c., in laying the first foundation of a Chemical School of Medicine, and lastly, by describing certain diseases which were previously unknown, and among which were measles and small-pox.

After the decline of the Arabian School of Medicine in the twelfth century, the greatest ignorance prevailed for the space of 300 years. This period, known as the Dark Ages, reaches to the commencement of the fifteenth century. The practice of medicine was almost entirely in the hands of the monks; they followed the doctrines and treatment of Galen, but combined with them many superstitious practices.

Chemistry alone made a slight advance, and this was owing to the absurd notions of the alchemists, who believed in the possibility of converting the baser metals into gold, and in the discovery of a medicine which should bestow upon its possessor perpetual health and vigor.

During the thirteenth century universities were established.

The fifteenth and sixteenth centuries may be regarded as a period of revival and preparation. Several remarkable discoveries during the first half of the fifteenth century tended greatly to promote the advancement

of learning. Among these may be enumerated the mariner's compass, the telescope, the microscope, the art of engraving on copper, and, above all, the invention of printing between the years 1435 and 1440.

Constantinople came into the possession of Mahommed the Second, and the literary treasures concealed in the Greek monasteries of Constantinople were conveyed to Italy, where the monks sought refuge. It was thus that for the first time the Greek writers could be consulted by the European in their original language. The first explorers of these ancient manuscripts occupied themselves with translating them into the Latin language.

During the sixteenth century the doctrines of Galen continued to prevail. Nevertheless, a new School of Medicine had arisen, which professed to proceed upon the inductive principle; first ascertaining the facts, and then forming its theories by generalization. Another rival sect consisted of the chemists, who, however, made greater progress during the succeeding century, and numbered among them some of the most celebrated practitioners of the period.

Paracelsus (born 1493) condemned the old pharmacy, and showed that chemistry could furnish many remedies unknown before. He performed many cures by the use of mercury and opium, the use of which latter drug he had learned in Turkey. The physicians of his time knew nothing of the use of mercury, and of opium they were afraid, as being "cold in the 4th degree." Tartar (cream of tartar—bitartrate of potash) was a favorite with Paracelsus; he called it Tartar (from Tartarus—the Latin for the infernal regions), because, said he, it contains or produces the water, the salt, the oil and the acid which burns the patient like hell ! !

At the beginning of the sixteenth century the prejudice to the dissection of the human body had somewhat abated, and several celebrated anatomists arose, and among them Sylvius, Aesalius, Eustachius, Fallopius, Fabricius, and, a few years later, the illustrious Harvey, the discoverer of the circulation of the blood. Chemistry had made some advances, and the knowledge thereof made use of in the treatment of diseases. Thus many circumstances combined to favor that progress in Medical Science, which occurred during the seventeenth and eighteenth centuries, and paved the way for the still greater advances of this nineteenth century.

When one thinks of the abominable remedies of the old physicians—toe nails, crabs' eyes, mummies' hair, fœces of animals—how they

sweated, purged, blooded, and otherwise tormented the poor patient (as, *e. g.*, they did Charles the II. on his deathbed), one cannot be too thankful that the science *has* progressed.

It was in the seventeenth century Boyle established Chemistry upon a scientific basis. Sylvius was the founder of clinical medicine, being the first who taught his pupils at the bedside. He was one of the earliest advocates of the doctrines of Harvey, and, captivated by the discoveries in chemistry, adopted the principles of the chemical physicians. One of the leading doctrines of this sect was the process of fermentation. The fluids of the body was supposed to be derived by fermentation from the elements of the body; and, again, it was by the same means that disease originated in the fluids. "Certain humors were considered to be naturally acid, and others naturally alkaline, and according as the one or the other of these predominated, so certain specific diseases were the result, which were to be removed by the exhibition of remedies of an opposite nature to that of the disease in question." According to the theory of the clinical physicians, fever was supposed to originate in an acid condition of the humors, and was consequently treated by alkalies.

Willis, the great anatomist, was the strenuous advocate of this doctrine. In 1659 he published a work on fermentation and fever, the object of which was to prove that every organ of the body has its appropriate fermentation, and that a morbid state of these ferments is the cause of all disease. Willis commenced by laying down as a principle that if any substance is submitted to analysis by fire, there results spirituous, sulphurous, saline, aqueous and terrestrial particles, from whence he concludes there are five elements. He endowed these elements with a number of imaginary qualities, and these, with the doctrine of fermentation, formed the basis of his system. By fermentation he understood an intestinal motion of the elementary particles of the body, having for its object the perfecting of the body, or its transformation into some other substance. The chyle, he says, is extracted from the food in the stomach by the aid of an acid ferment, and obtains its milky character by the operation of the sulphurous and saline particles which are mixed with the ferment. It was also by a process of fermentation that the animal spirits were separated in the brain from the purest sulphurous particle of the blood.

Another sect, which arose during the century, was that of the mathematical physician. The first person who adopted this method of investigation was Sanctorius; but Borelli, Professor of Mathematics at the

University of Pisa, must be regarded as the actual founder of this sect. Borelli and his followers treated the body as a machine; but they were compelled to admit or suppose the existence of a sensitive soul residing in the brain, and of a nerve fluid which traverses the nerve fibres, and is under the control of the former. The great work of Borelli (De Motu Animalium) was divided into two portions, one relating to the external visible movements of animals, the second to the cause of those movements. Many illustrious and learned physicians supported these mathematical doctrines.

Baglioi was the first writer who called the attention of physicians to the solids of the body. Hitherto the fluids of the body had been exclusively regarded as the seat of disease. Baglioi was thus the founder of Solidism, in contra-distinction to the exclusive views of the Humorists; at the same time he admitted that some diseases might depend upon derangement of the fluids.

During the contentions of the rival schools of chemistry and mathematics, Van Helmont arose; he was a supporter of the chemical theories, but superadded the doctrine of the existence of a governing power or a spiritual emanation, which he imagined presided over the body, and was seated in the brain, to which power he gave the name of Archæus. These notions were further developed by Stahl, the enunciator of the doctrine of Vitalism. Having stated that "life is nothing more than the preservation of the fluids of the body in a state of integrity and of perfect intermixture, in spite of their tendency to putrefaction—a tendency which shows itself so soon as they are freed from the influence of the vital force"—he then demands, what is the principle or agent concerned in this fundamental act! He endeavors to prove it can be no other than the immaterial and sensitive soul, or anima.

This doctrine of Vitalism was adopted, in a modified form, by his contemporary and colleague, Hoffman. The influence which Stahl attributed to his anima, Hoffman referred to the nervous system, thus substituting a material and recognized structure for the invisible and hypothetical anima, or governing power, of Stahl.

Such is a general outline of the principal theories which have prevailed in medical science, from the earliest period to the present time.

In the meantime, aside from all theoretical views, our knowledge of anatomy, physiology, pathology, materia medica, and therapeutics, has been gradually and rapidly advancing, and the whole has combined to constitute the most rational and perfect system of medical science which

has ever been employed. Viewed in reference to the past, the medical doctrines of the present day may be pronounced to be a system of eclecticism; considered in relation to the principles upon which the science of medicine may be founded, it may be termed a system of rational empiricism. With Hippocrates, we admit the necessity of a minute and accurate knowledge of the human body, and of the changes which are superinduced in it by disease. With the Empirics, we acknowledge that we must be guided by experience in the treatment of disease. With the chemical physician, we perceive that many of the functions of the body can be explained upon the principles of chemistry, and that the action of numerous remedies may in like manner be accounted for by the same means. With the mechanical philosophers, we are conscious that there are certain physiological and pathological phenomena which may be referred to the operation of mechanical causes. And again, whether we make use of the word "Archœus" or "Anima," or whether we call to our assistance the operation of the nervous system, or hide our ignorance under the modern term of "dynamical," we perceive that there are phenomena taking place, both in the healthy and diseased body, which our present knowledge of the physical sciences will not enable us to explain. These phenomena can only manifest themselves in the living body, and all our researches and experiments have hitherto failed to afford a scientific explanation of them.

With regard to the seat of disease we are neither humorists nor solidists, but both. Since the body is composed of solids and fluids, so either the one or the other may be the primary seat of disease; and further, we know that an organ may be structurally healthy, but may become functionally deranged, through the influence of the nerve filaments with which it is supplied.

Materia Medica and Therapeutics.

Materia Medica.—This term is used to designate that department of medicine which treats of remedial agents, of whatever kind, used in the treatment or alleviation of disease. It is not only necessary to recognize the appearances and indications of accident, the variations and deviations of function which constitute disease, but you must be familiar also with the means of curing or alleviating them. Anatomy and physiology guide you to the former, and surgery and therapeutics furnish you with the latter. This knowledge, when reduced to practice, consists merely in the application of remedies for the relief of suffering disease. If you

have no knowledge of the remedial agents, or their mode of application, you are poorly equipped, your knowledge is confined to bare manipulation. We have many varieties of toothache, and also neuralgia, which you may be able fully to diagnose, but if you fail to have a knowledge of the various remedies and their application to each particular variety, how often will you be baffled, and not unfrequently at a loss in your endeavors to cure your patient; yea, rather you are not only powerless to do good, but very apt to do harm; the mischief likely to arise through this want of knowledge is incalculable, and those who guide the medical education of the dental student are much to blame for the very inadequate provision hitherto made for their education in the use of drugs and chemicals. I think you cannot over-estimate the importance of this branch of your education, and it is most worthy of your serious attention.

Let me remind you nothing secures the confidence of a patient so readily and completely as the ability to predict the effect of the medicine you prescribe for him. He himself expects results, and if these accord with your predictions, you have already done much to relieve him. And it is necessary not only to be acquainted with the various drugs and chemicals you use, but also to possess the knowledge to enable you to detect impurities and adulterations in them. A practical knowledge of chemistry will help you in this matter; indeed it is almost indispensable to the efficient study of therapeutics.

In order to employ drugs with certainty for the relief of sufferers or the cure of disease, we must seek to know what part they will take in the various processes upon which life depends; for this really constitutes the science of therapeutics.

The knowledge here spoken of I shall do my best to impart, but it will be rather of the nature of a foundation, the superstructure itself must be built up of observations personally made and recorded.—*From Monthly Review of Dental Surgery.*

AMALGAM STOPPINGS AND THEIR DEFECTS.

Mr. Bridgman, in his paper on the above, has evidently started with a dominant idea, which, I think, has biased his judgment. The results he has obtained are all clearly explained by simple mechanical and chemical action; and although electricity, both in theory and practice,

has been my favorite study and amusement for the last thirty years, I see nothing whatever in Mr. Bridgman's experiments which have the slightest connection with electricity in any way.

In saying chemical affiinity is only another term for electrical attraction, he has rather overstated his case. I might, with equal truth, say that five sovereigns are only another form of a five-pound note. They may possibly be convertible, but they are by no means the same thing, although they have most properties in common with each other.

When weak acid comes in contact with amalgam filings it simply acts as any very mobile* liquid would when brought in contact with any other chemically clean surface composed of a mass of capillary crevices. If the filings were greasy or dirty this action would not take place.

With regard to Mr. Sullivan's amalgam, the contact with weak acid cleans the surface, which was previously covered with oxide of copper, acting in this case as a flux between the beads of mercury and the mass of copper.

Mr. Bridgman is in error in stating that Sullivan's amalgam is "copper and silver." It is simply precipitated copper and mercury; he is also in error in stating that sulphuric acid has no affinity for copper, the contrary being the fact. In testing samples of Sullivan's amalgam the question of affinity for copper has nothing to do with the matter; the acid simply dissolves the oxide of copper instantly, and leaves a clean surface, with which the globules of mercury can amalgamate.

The experiment with zinc filings admits of similar explanation. The acid coming in contact with a large surface of a very soluble metal is instantly converted into a solution of sulphate of zinc; it is no longer free acid and the solution is far less mobile; the zinc also oxydizes slightly in a very short time after filling up, and the two changes are sufficient to visibly reduce the speed with which the fluid traverses the heap of filings.

I do not wish to discuss general chemistry, or in reply to the statement "before a metal can be dissolved it must have assumed this com-

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* The term "mobile," as applied to a fluid, is well explained by the following experiment: Take a syphon with a small bore, and with this empty the same vessel filled with different liquids. A vessel full of water, which is emptied in 50 seconds, requires 84 seconds if the water is replaced with petroleum, and 86 seconds if with whiskey. Specific gravity has little or nothing to do with the matter, as is clearly proved by the fact that a certain quantity of paraffin oil is emptied in about two-thirds the time required for the *same quantity of petroleum of the same specific gravity.*

bination of oxygen," I might ask, Where do all the metallic salts come from which contain no oxygen?

Mr. Bridgman refers to cadmium, "which stains the whole dentine of the tooth." It only does so under some conditions. He is, perhaps, not aware that quite recently a malleable amalgam was introduced to the profession *as the result of years of experience*, this amalgam being principally composed of cadmium. Although a few weeks' or months' experience *in the mouth* proved it utterly worthless—it did not discolor the teeth, and although rapidly dissolving and disintegrating in the mouth it had not, so far as I am aware, any constitutional effect

The statement, "when a positive stopping is placed in a living tooth it generally becomes exuded," may be, I think, more correctly rendered, when a *soft* filling in any cavity with damp or wet walls is left under water for a time it loses its form, appearing to rise above the the level of the margin, the change being simply in the form, and it may be entirely prevented by the exclusion of water or any other fluid which has the power of driving in between the walls and plug, by the force of capillary action.

"An old metallic stopping on becoming dislodged from the cavity of the tooth is invariably more or less blackened and rough on the surface which has been in contact with the dentine." It certainly is rough because the walls of the cavity are left so from the excavator, but if perfect contact has been ensured and kept I totally and distinctly deny the possibility of discoloration under any plug, whatever the material. I have myself seen plugs jet black on the exposed surface and perfectly clean underneath. The opportunity of seeing the underside of a plug which is in perfect contact with the walls, is one which will occur rarely in the lifetime of any dentist, simply because such a plug, unless under extraordinary conditions, goes to the grave with its wearer.

Last, and worst of all, Mr. Bridgman enters his verdict in favor of washing amalgams. This I must most strongly protest against. It is, I am certain, *not* the result of experience, and it irretrievably ruins nearly, if not quite, every amalgam. If good results can be obtained with washing, incomparably better results can be obtained without it.—Thos. Fletcher, *in British Journal of Dental Science.*

A REGULAR MEETING OF THE FIRST DISTRICT DENTAL SOCIETY WAS HELD AT THE HOUSE OF DR. PRESSLAR, PLACE, ON THE EVENING OF FEBRUARY 5TH, 1878, DR. ALLEN IN THE CHAIR.

Incidents of Office Practice

Dr. Mills : I would like to speak of a case I mentioned before the Society, some time since, of the extraction of a pulp. I saw the pulp again last Saturday, and it is as lively as it ever was.

Dr. Atkinson : Two weeks ago last Sunday I made an operation in my office for a myxo fibroma tumor at the third superior molar, without an anæsthetic of any kind. I refused to give an anesthetic, and it is my opinion—after some effort to get at the pros and cons, that there is no operation that is not capital in which anæsthetics will be given by a man who is properly educated and has the proper kind of character. There are so many reasons why we want the patients' consciousness to assist us in making operations, and in accommodating us, that it would be an endless thing to speak in this direction. This was a tumor which had been pronounced malignant, and my impression was that it very probably was malignant, but that it was of such a character as not to be self-occurring—that it must be extirpated or involve all the difficulties that were consequent upon its being allowed to remain in the mouth. The operation was made, as I say, without anæsthetics, further than an anæsthetic that the patient asked for himself—a couple of ounces of brandy. He brought the brandy, and I allowed him to take it. It kept up his courage, he said. The tumor has been examined by competent authorities and pronounced non-malignant on its first appearance, but is liable, if it is reproduced, to be malignant after the third growth of the tumor, and I take occasion to invite you to see the case on any Sunday morning at 10:30. It is a case that will continue a number of weeks yet. There were some eighteen persons present at the operation, and, as usual, there were several there that could make the operation themselves very much better than it was made, and remarks of that kind, that I hear made even by men that are not entitled to an opinion about it—men who don't know anything about the difficulties of the case, and we must be careful how we put that import-

ance to the prejudices of men, and dignify their prejudices with the nomen of opinions. We want to be very careful about that. That was an operation that if we had voted about it I would have been as badly in the minority as I am to-night as to whether an anæsthetic should be used or not; but, thank God, we are growing, and one of these days we will be very careful about rushing in where wiser heads fear to tread with such iconoclastic fervor as has been shown to-night by the Chairman of the Clinic Committee, and the case that comes from Cooper Union. I think all these are caveats to us that we ought to be careful. It is a serious thing to be a dentist, and be in charge of a case that may prove fatal to the patient.

Dr. W. M. Reynolds: Would Dr. Atkinson perform that operation for a delicate lady without anæsthetics?

Dr. Atkinson: I don't care if it was an infant in its mother's arms or a grandfather tottering over the grave. It is no matter. The man who understands what function is would not make any difference in these cases, because all the differences that would arise are not opinions —judgments not worthy the name of judgments. They are mere figments—mere prejudices, as I am able to prove. We must know what function is before we know what this aberration is. We had better be a little cautious about being willing to take responsibilities. Some remarks were make about medical men. I endorse all the words the gentleman has said, *minus* the bitterness with which it was said. Medical men have been struggling a long time, not having the opportunities that dentists have had. Public opinion says that the dentist is a greenhorn. They never said that to me, because I was a medical man before I came into dentistry. Do what you ought to do, if the heavens fall. Don't act unless you know what you are doing. If you build your opinion upon some one else's judgment you are at the mercy of a figment, and you will be left in the lurch. We must rise to the *status* of our worthy calling. I don't go back on dentists. If I were to take my choice between medical men, ministers, lawyers, and the dentists, I would go with the dentists.

Dr. Reynolds: I did not intend to cast any slight upon the medical men. I do object to their smothering the patient while they are giving the anæsthetic, so that there is no air inhaled with the anæsthetic.

Papers by Drs. Odell and Weld.

Subject: Qualifications Requisite for the Practice of Chemistry.

Dr. Latimer: I was reminded yesterday of a case that occurred in

the office of my friend in a Western part of the State: A lady came into the office and said she had a remarkable growth in her mouth. She wanted the tooth filled on the opposite side of the mouth, but didn't wish the growth disturbed, for the bone protruded, and she would have to undergo an operation. She had the case examined by several physicians and two or three dentists. My friend, taking his glass, examined the case very carefully, and, sure enough, there was a large protuberance, having the appearance of an egg. He thought it a very singular thing, and getting his finger under it he brought some pressure upon it and the whole thing came away and came out in the mouth—a mass of salivary calculi. It is a very curious specimen. This pertained to the subject under consideration: the necessary knowledge to the practice of dentistry. If the dentists who had examined the case had been possessed of common sense, or the physicians who had examined it had known about similar cases, they would at once have detected the abnormal secretion. It is a great pity that dentists do not know when they are attending their college course or finishing their studies, what they are going to do for a livelihood. I have regretted, and always shall, that I could not know what profession I was going into, and I resolved that if I had a boy to bring up I would bring him up with some business in view. I lost several years of my life in not knowing what kind of business I was going into.

The last three years that I studied, before I studied dentistry, I devoted to branches that are now almost entirely useless to me—matters that have no interest or moment to me now. If I had known that I was going to practice dentistry—I could have fitted myself very much better. When I did commence I had to begin at the very foundation and unlearn a great deal that I had learned improperly, so that I lost a great deal of time in preparing to be a dentist I am reminded of it by the subject to-night. If I could have learned about anæsthetics just as we may learn by having clinics and talking the matter over in the clinics and discussing it, I should have been better qualified to serve my patients. I commenced giving anesthetics when I had been a few years in practice, and I had to put up with what I could find out about them, and instruction was very indefinite and very diverse, and I had to feel my way along, and felt my insufficiency to do the thing as it ought to be done. When I commenced giving the nitrous oxide, I remember there was only one place where I could find it was given. I went to the person and tried to learn something about it. I got my chemistry

and studied up as well as I could what was written in regard to it, and I inquired about it from every Tom, Dick, and Harry. This man who was giving nitrous oxide on the sly would not tell anything about it, and would not show his apparatus. I learned from one of his patients that he had a barrel, and a butter tub, and as he made the nitrous oxide, the tub raised in the barrel of water. That was about the clue I had. I manufactured the nitrous oxide and inhaled it myself and gave it to my wife, and experimented with wash-bottles to get it pure. After I was satisfied of its purity, then I commenced cautiously to give it to my friends; then I gave it to my patients. I went on in that way until nitrous oxide became a specialty and parties made a business of it, then I got out of it as soon as I consistently could. In giving chloroform I had to feel my way pretty much in the same way. I was in practice in the South, and I went a long way to see a man who was skilled in giving chloroform. He was a professor in a medical college in Augusta. I found that this one who claimed special skill was entirely at sea in regard to resuscitatives, and from what I could learn from the physicians there who administered anæsthetics, there was very little known, apparently, about the proper means of resuscitation, and I never felt satisfied in giving chloroform—never felt satisfied of my ability to manage the case.

I read every journal in which I could find anything in regard to anæsthetics, but I felt it was tampering with a dangerous thing, and I could not find out about the degree of danger nor the proper restoratives. I have never had a serious case, however. I will mention a case of a physician, Dr. Neelaton, who took the ball from Garibaldi's foot, giving an anesthetic to the Empress Eugenie, in which breath had stopped and the pulse ceased, and the Empress was taken up by the feet, and artificial respiration restored, and she was brought back to life. To all intents and purposes she was dead, and had to be restored. Those who are giving anæsthetics, as a rule are not prepared to give restoratives. I have been called in consultation and have had to operate in a number of cases where anæsthetics were given, but I always like to keep away from such cases if I can. There is danger, and I feel that a physician is not prepared for an emergency, scarcely ever having a battery or knowing how to use it in cases of unpleasant result.

Dr. Mills: Dr. Atkinson said it was a serious thing to take the responsibility of being a dentist, and the older I grow the better I am satisfied that is more truth than fiction. As we look around among the

dentists in general, it seems to me that we have a proof of the fact that you can make a dentist of almost anything that has head and heels. I have been surprised in seeing how little it takes to make a dentist, and how much it takes to be what a dentist ought to be.

It is a fact that very strange men sometimes make a success in the world, but it is not a proof that the appearance of the man is what he will make. There are three strong points, taking a man up to the age of maturity. He must have honesty, culture, and earnestness, and we have a pretty good base to start a dentist, and it seems that these are vital requisites in dentistry. If I had a son that I wished to bring into the profession, I would give him an education in the schools; then I would give him a medical education, and then put him as a private pupil with a dentist. I would want him to be an educated gentlemen. My idea would be that when he had received a good medical education, with the private instruction which I could give him, he would be fitted to be a good dentist. When I say myself, I give that idea as a general one.

Dr. LATIMER: Would you require him to go through a dental college?

Dr. MILLS: That is a delicate point for me to settle. I would give him that advantage. I think I could teach him dentistry myself. I would give more for a medical school, which gives all you get in a dental college, in regard to the scientific part of it. I do think that the failure to-day is the want of a backbone in medical education.

Dr. LATIMER: I am sorry to hear Dr. Mills go back on dental colleges. I believe in supplementing the medical colleges by private pupilage three years with a competent man, and then a diploma from a dental college. Medical colleges cannot teach our specialties, and a private preceptor may teach his bias, but in the college you get the various ideas of the professors of the college, and all of these good things make a perfect dentist.

Dr. MILLS: I don't understand that there are principles in the medical college which would cover all the ground. I think we get a great deal more which is of more benefit. Taking the medical education and such advantages as are offered in the teachings of Dr. Heitzman in his lectures on Histology, I think, covers the ground of the teachings of dentistry. There are advantages there which embrace, according to my understanding, all the requisites we have. I don't find fault with the dental colleges. I could find fault if I wanted to. I think there is a great deal of humbug as they are managed. It is our fault more than

theirs. I believe that the dental profession of to-day, if it gave a medical education, would have more backbone about it. We will never be a profession until we do that—until we have a medical foundation.

Dr. Atkinson: As to the management of patients when under the influence of anæsthetics, it resolves itself into two things: either an ænemic or a congested condition of the blood vessels of the brain. If we are sufficiently acquainted with physiology and can diagnose the cause, act accordingly. But suppose you have been mistaken and the heart's action, by its influence on the blood vessels of the brain, pressing upon the nerve center has shut off the function of the neumo-gastric fluid, elevate the feet, and what do you? Then you put the final finish to the patient. Had we better not be a little cautious in running these risks? An instance may occur in which we have made these movements and have nothing to aid with the recovery. Always pull the tongue out so as to give an open passage for the circulation of the air.

Dr. Latimer: Suppose there is an accumulation of saliva and blood in the throat passing into the stomach and lungs?

Dr. Atkinson: Wipe it out.

Dr. Latimer: Is it not the quickest way to lift them up, that gravity may help to clear the throat promptly?

Dr. Atkinson: No; take a sponge and wipe the throat out. I wish to avoid all these things and come to something that every man will see means a principle; that these two points are to be taken into account. What is the next point? How does the anæsthetic act? Chloroform acts it is not known how. It can be used to a certain extent with some constitutions. Other constitutions can be killed by it. We are not sufficiently acquainted with the functions that exist between the nervous system and the vascular system, to entitle us to an opinion upon this subject. We are at sea. That is the reason I say don't use anæsthetics. That is the reason I am against anæsthetics in toto, except in dernier cases.

Dr. Latimer: And not learn anything about them?

Dr. Atkinson: I don't know how to reply to such a suggestion as that, because it has two phases—one of simple infantile earnestness of inquiry, and the other a sneer. I am above or below both. I think a man who has felt the responsibility of life can not be so derelict in his duties as not to desire to know. I don't know how to practice dentistry if I don't do it religously. I don't know how to live if I don't live religiously. Be in earnest all the time, and let this

go where it belongs. Work in the line of your calling with your whole mind and strength, and be as humble as a little child. I want to give my best thought to my fellows and let them utilize it. What are we but a conglomeration of the utilizing of each other's ideas. That is where we stand. As to colleges: What is the reason you cannot point me to a dental college that will not allow any man to make an operation as he desires? Name a dental college that will admit any man to come and make a clinic before their classes. I don't care who it is. They are like the dog in the manger—they have neither eaten the hay nor let the cow eat it. They have arranged a system by which they don't allow the practice to be known. If you have any such college inform me of the fact. I have cliniced in most of them. I know why I am not invited to clinic. I was told my standing was too high! Can that be? Never. So that there is some sense in what Dr. Mills has said, but at the same time that does not do to say if we cannot have a whole loaf we don't want half a one. They are getting better. They are better to-day than they ever were—very much better; and I am certain they are getting better very fast. Now, if those advocates of the administration of nitrous oxide will tell us how it acts, I am ready to get on my knees and listen to them. I have asked that question of the advocates of it. Who are the men who use it? In my judgment as a man, the men who understand it the least. I take the same course as Dr. Latimer. I suppose I am the first man who ever made chloroform in the United States as an anæsthetic. I made a miserable botch of it. I have been all through that thing. I say to you, gentlemen, if I never meet you again, be careful how you use agents that you don't know how they operate upon the human body. Be careful! That I would emphacize as my last and best word to my best and dearest friend. There is an anæsthesia that I admire—a noble power and strong affection for the patient exercised by the man who has been endowed by the heavens for his calling, and it is wonderful what he can do.

Adjourned.

EDITORIAL IN BRITISH JOURNAL OF DENTAL SCIENCE.

London, March, 1878.

As we predicted in our leader for June, 1877, the impolitic action of the Dental Reform Committee in endeavoring to prevent medical men from calling themselves dentists either alone or in combination with the

word surgeon, unless they possess a dental diploma, has raised a storm of opposition in the medical world which bids fair to wreck the whole bill unless the promoters of it withdraw the obnoxious clauses. This we are given to understand they are prepared to do, and we are glad for the sake of the chief principle of the bill that they have at last come to this conclusion, which, had they arrived at earlier, would have saved them an immense amount of needless work and unnecessary expense. As we wrote before, what we want "is the reform of the mass—legislation to prevent any tinker or tailor, engine-fitter, or watch-maker who fails to succeed in his employment, from setting up as, and calling himself a Dentist, Surgeon Dentist, or Dental Surgeon." This is what we have advocated from the very first. In this alone we are vitally interested, and not in the control of the few educated surgeons who from circumstances may be induced to take up the practice of dentistry.

Unquestionably, as we wrote before, the *principle* is right, that surgeons, though fully entitled to practice Dentistry, should not call themselves by a title which is in future to imply that they possess a special dental diploma. But the practical infringement of the principle is so slight that it was unwise to enter upon the most impolitic course of attempting to enforce a principle of so little practical value. For consistency's sake we have deemed it right once more to place our views clearly before our readers, but we shall refiain for the present from any further comments upon passing events, unwilling on the one hand to add to the troubles of those who are zealously laboring on behalf of the bill, and on the other to run the risk of further wounding the susceptibilities of its opponents; but at some future time we shall endeavor to show the real character of the medical opposition which has been raised against the bill, and whence it has proceeded.

EDITORIAL.

On page 112, of our March number, in an article taken from the February issue of the *British Journal of Dental Science*, some remarks are attributed to Dr. Hill which we find on examination of the stenographic report of the meeting, are directly the opposite of the actual remarks made by the Doctor. So, too, what Dr. Rich said appears to have been said in reference to Dr. Hill, while, in fact, it had entire reference to a paper previously read.

We were misled by the raciness of the article in its treatment of Dr. Flagg's new departure—better reported since in the official report—into republishing this article.

Our attention was called to its unfairness to Dr. Hill, not only by the Doctor but by several friends, and we are most happy in taking the earliest possible opportunity to make the above correction. We know Dr. Hill to be a particularly cautious and neat operator, and had our attention been drawn to the item referring to him, would not have admitted it to our pages in the first instance.

BOOK NOTICES.

THE DENTAL AND ORAL SCIENCE MAGAZINE. Edited by J. E. DEXTER. Published by R. S. WILLIAMS.

This new venture in a journalistic way is dated February, 1878, and is almost exclusively devoted to the transactions of the New York Odontological Society. It is neatly printed on good paper, and its illustrations are excellent. As a report of the doings of this most renowned and respectable society it leaves nothing more to be desired in that direction, and so should be taken by all who would keep a full collection of dental publications. It, however, does not at all supply the place of a regular dental journal, in which we expect to find general information about dental matters the world over.

We wish the quarterly and its coadjutors abundant success.

NOTES.

Merrimack Valley Dental Association.

Fifteenth semi-annual meeting of the Merrimack Valley Dental Association, will be held at Tremont House, Boston, Mass., Thursday and Friday, May 16th and 17th, 1878, commencing at 11 A. M. on Thursday. Essayist.—Prof. L. D. Shepard, of Boston, Mass.; Dr. A. M. Dudley, of Salem, Mass.; Dr. A. W. Tenney, of Stoneham, Mass.; Dr. Wm. Jarvis, of Claremont, N. H. Clinical Operators—Prof. I. J. Wetherbee, of Boston, Mass.; Dr. G. F. Waters, of Boston, Mass.; Dr. I. A. Salmon, of Boston, Mass.; Dr. G. A. Young, of Concord, N. H. Subject for discussion—"The New Departure." All respectable members of the dental profession are invited to to be present, and join the Association.

W. E. RIGGS, Secretary.

Lawrence, Mass., April 8, 1878.

The New Departure.

A very general interest is being manifested by the dental profession in the

theories and practice which have come to be comprehensively designated as "The New Departure." The action of filling materials upon dentine, as promulgated and ably discussed and advocated by Dr. S. B. Palmer, of Syracuse, N. Y., the result of earnest scientific investigation; the indorsement of his conclusions by Prof. Henry S. Chase, of St. Louis, and Prof. J. Foster Flagg, of Philadelphia, as the result of their observations and experiments; the modifications which these gentlemen are advocating and practising, the outcome of these theories and deductions—these constitute what is termed "The New Departure."

The unanimity of thought in this matter with which the three gentlemen named are credited, may be appreciated from the statement that the New Departure creed having been drafted by Prof. Flagg, and submitted by him to Dr. Palmer and Prof. Chase for revision, received their written indorsement without modification.

ACCEPTED CREED.

I. Gold is the *best* material with which to save teeth.

II. Either "contour filling" *or* separating teeth" is the best method to arrest decay.

III. Failure in operation is mainly due to defective manipulation.

IV. A tooth that is worth filling at all, is worth filling with gold.

V. "Unskillful and unscrupulous" dentists fill with tin covered with gold, *thereby* causing galvanic action, pulpitis, death of the pulp, abscess, and *loss of the tooth.*

VI. A filling, to be *good*, must *not leak.*

VII. Gutta-percha, *properly used is* good enough for *temporary* fillings.

VIII. A *good* gutta-percha filling, in its proper place, is better than a *poor* gold one.

IX. Amalgam, *per se*, is a *poor* filling material.

X. The use of "plastic" filling material tends to lower the standard of dentistry, thereby diminishing its sphere of usefulness.

NEW DEPARTURE CREED.

I. In proportion as teeth *need* saving, gold is the *worst* material to use.

II. Neither "contouring filling" nor "separating teeth" has much to do with the arrest of decay.

III. Failure in operation is mainly due to incompatibility of filling material with tooth-bone.

IV. A tooth that can be so treated as to be satisfactorily filled with *anything* is worth filling.

V. Skillful and scrupulous dentists fill with tin covered with gold, *thereby* preventing decay, pulpitis, death of the pulp, and abscess, *thereby saving the tooth.*

VI. A filling may be the *best known* for the tooth, and yet *leak badly.*

VII. Gutta-percha, *properly used* is the *most permanent* filling material we possess.

VIII. A *poor* gutta-percha filling *in its proper place*, is better than a *good* gold one.

IX. Amalgam, *per se*, is an *excellent* filling material.

X. The use of "plastic" filling material tends to lower that dentistry which has for its standard of excellence "ability to make gold fillings," but very much extends the sphere of usefulness of that dentistry which has for its standard of excellence "ability to save teeth."

PARAFIN PAPER.—A very handsome quality of this useful water and acid-proof paper may be had of J. H. Simpson, 667 Sixth Avenue, New York City, either white, colored or manilla, in sizes ranging from 10x15 to 15x20 in.

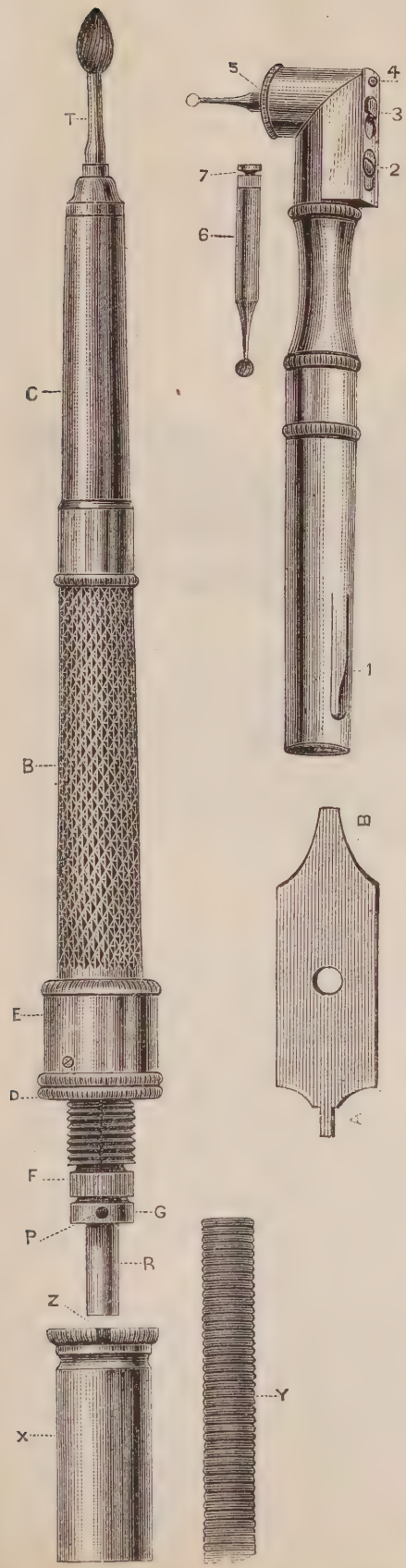
JOHNSTON BROTHERS

Cone-Journal Hand-Piece

FOR ANY DENTAL ENGINE.

The Greatest Improvement in Dental Engines since 1872.

PATENTED MAY 18, 1877.



We advise our friends to purchase and use the Cone-Journal Hand-piece, for the following reasons:

1st. It is the only Hand-piece constructed in accordance with mechanical principles, and in such a manner that the spindle will not wear so as to run out of true.

2d. The adjustable conical journal-seat takes up all the wear on the journal, so that the Hand-piece will run as true after many months' wear as when new.

3d. Excepting only that of the suspension engine, it is the only Hand-piece which runs steady enough to carry a disk satisfactorily and without danger of breaking.

4th. It is so constructed that oil cannot find egress, either to the hand of the operator or to the lip of the patient.

5th. The conical journal at the nose of the Hand-piece is placed so far back, and is so protected, that no grit or dirt can reach it.

6th. It is the most durable Hand-piece ever offered to the profession, and will not need frequent repairs; hence it is the cheapest to buy.

It is so proportioned that the various attachments used on the Cable or White Hand-piece can be used with this.

It uses our C (also the Universal) bur, and the White bur can be readily altered to use with this Hand-piece.

Send for Circulars. It is warmly recommended by Drs. CHAS. F. ALLAN, CHAS. D. COOK, GEO. L. MASON, GEO. S. ALLAN, S. G. PERRY, N. M. ABBOTT, DELOS PALMER, H. G. MIRICK, R. F. AMBLER.

Price of Hand-Piece, and one dozen Cavity Burs, $10.00.

Right Angle..... 5.00.

Wilkerson Dental Chair.

PATENTED NOV. 20, 1877.

PRICE, $175.

The cut is a good representation of this unique chair. The acknowledged requirements of a first-class dental chair have been here secured by Dr. M. B. Wilkerson—the inventor—by methods showing great originality. All cranks are dispensed with and levers substituted for them. The chair is raised by pressure of the foot on the long lever, which hides the back foot in the cut. This operation requires very little effort, and occupies but eight seconds, and is only equivalent to stepping up eight steps. To lower the chair one has only, with the toe of his boot, to raise the lever just back of that first named, and the chair sinks rapidly and noiselessly until the lever is dropped, when it instantly stops. Except when in use the long lever folds in under the chair.

A touch of the lever in front of that just named, leaves the chair free to rotate through the whole circle. Directly beneath the seat of the chair, and close to the seat, is shown a lever, which, when pressed forward, permits the rocking movement while the lever is held, but whenever released fastens the chair in position.

Thus the three principal movements, elevation, rocking and rotation, are accomplished. The minor movements, all of great importance, however, are the raising or lowering of the back of the chair; the raising in like manner of the head-rest; the slight rocking of the seat of the chair, so as to prevent the patient from sliding forward; the adjustment of the footstool at various lengths and heights; the spring back support to rest the small of the back. This, at will, is converted into a capital child's seat.

An arm-rest is shown at the right of the head-rest. It can be secured on either side of the head-rest at will.

The whole chair is of the most substantial construction and highly ornamental. It will be upholstered in either green or garnet plush or in leather.

This is *not* an hydraulic chair. It has *no pump*, but is raised simply and solely by a lever actuated by the foot. When raised, the elevation of the central column, which supports the chair, tends to produce a vacuum in the chamber through which it passes, and this chamber is immediately filled by a column of oil, which, opening a valve at the bottom of the chamber and directly following up the central column of the chair, blocks it up whenever the lever ceases to raise it higher. Of course, whenever the same valve is tripped, the oil flows back into its receptacle, and the chair is rapidly and noiselessly lowered. *Not one drop of oil* has ever or can ever find egress from the inner base of the chair to its exterior. So much to silence constant misrepresentations of another dealer.

ADVANTAGES.

1st. It can be raised with the foot of the operator, and by a very slight effort.

2d. It can be raised in half the time of any other dental chair, except the Morrison.

3d. It can be lowered without exertion of force, and as much or as little, or as fast or as slow, as desired, by merely opening a valve.

4th. Its range of movement is superior.

5th. It has a perfect forward and backward movement, so that the patient can be rapidly inclined at any angle by a very slight exertion of force by the hand.

6th. Its arrangement for children is unique and excellent.

7th. Its footstool is readily adapted to the wants of large or small persons.

8th. Its head-rest is completely firm in any position in which it may be placed, has a large range, and is fastened by a single movement of the hand.

9th. The operator can control all its movements without once taking his hand from the mouth of the patient.

10th. It has a perfect rotary movement.

11th. By means of an adjustable foot it will stand firmly on any floor, however uneven.

We have orders for a large number, and are receiving more daily, and entering them in rotation.

JOHNSTON BROS., 1260 Broadway, N. Y.

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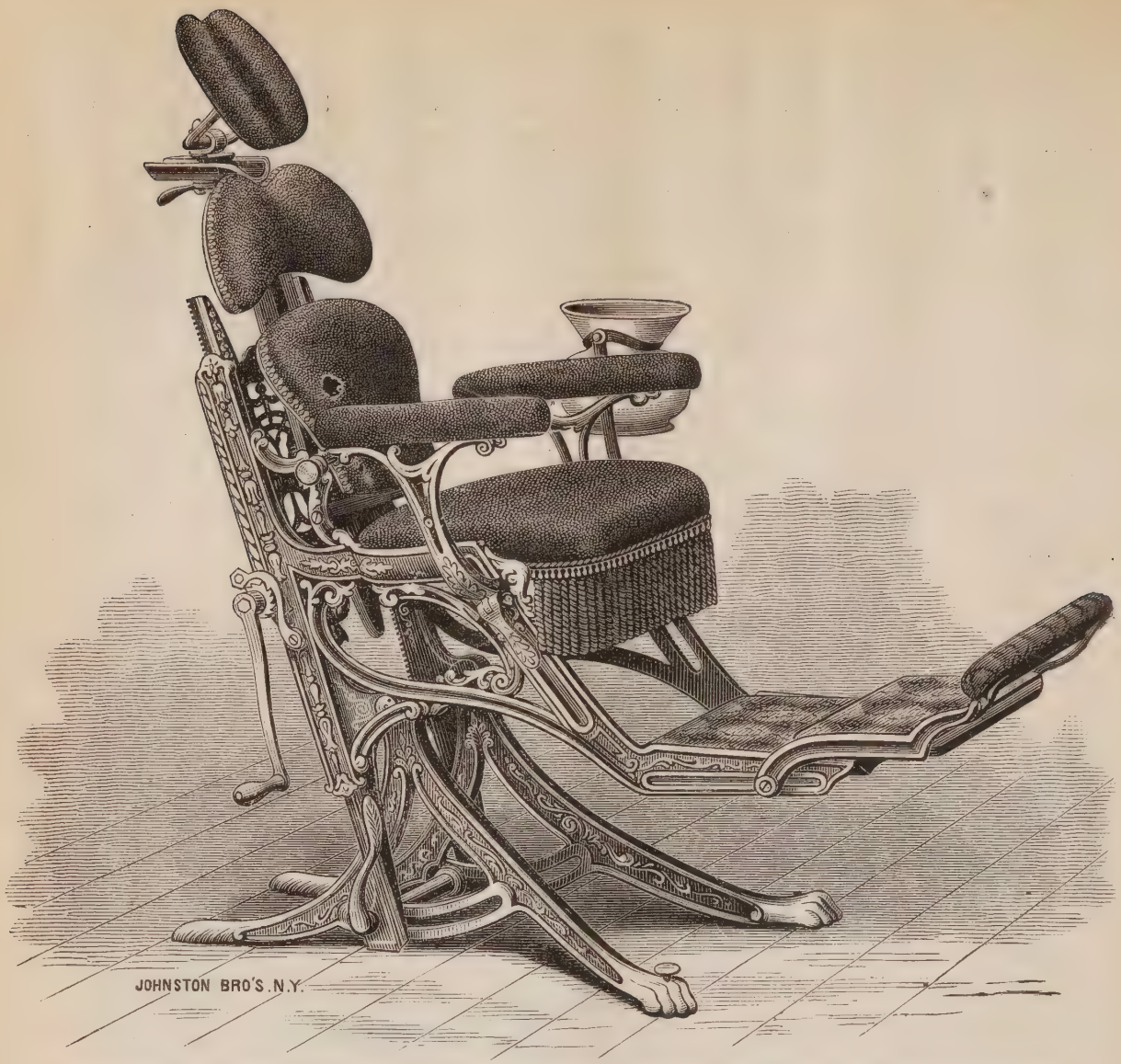


Comfort for both Operator and Patient, Rapid Movement, Simplicity of Construction, Great Durability.

The desirable features of a dental chair are almost completely enumerated above. The Morrison Chair answers each of these requirements more completely than any other chair made.

It contributes to the ease of the operator:

1st. By the lightness and rapidity with which the patient is raised or lowered to a convenient position.

2nd. By the form of its back, which is so narrow as to render it unnecessary for the operator to stretch to reach his patient.

3d. By permitting him to drop either arm of the chair entirely out of his way.

4th. By making it possible to operate in either a standing or sitting posture with equal facility.

It affords comfort to the patient:

1st. In the arrangement by which the lower back-pad may be moved forward to support the small of the patient's back.

2nd. The upper back-pad is readily raised or lowered, so as to exactly adapt itself to the wishes of any patient as if the chair had been made for this one person.

3d. By the readiness with which the patient may change the foot-stool from one position to another as suits their notion at the moment, and without disturbing the operator.

If desired this chair can be furnished with either the usual upholstery of dental chairs, or with Turkish upholstery—soft and with springs; or with summer seats and back—of cane; or with separate sets of all of these, which can be changed from season to season by the owner without difficulty or the necessity of employing mechanics of any kind.

Its movements are very rapid.

It can be raised from its lowest position, in which the seat is 15 inches from the floor, to its highest, 42 inches above the floor, in seven seconds. Both low

and high based chairs are here combined in one, giving a vertical range of more than two feet.

It has no equal in operations upon Children.

The child can be raised as high as needed by the tallest operator.

It is provided with a comfortable back and head-rest, exactly as is a grown person.

The foot-stool is quickly adapted to children of any size.

It is extremely simple.

The principal movements of the chair and head-rest are all under control of but three clamps, and the chair is adjusted in height by a single crank.

By one of the above-mentioned clamps it is securely fastened at any desired inclination, and all done in an instant.

It is very durable, because

1. Being made almost entirely of metal, open joints or season cracks are impossible.

2. The upholstery of this chair is so arranged that it can be renewed, by exchange of the upholstered parts, without leaving the rooms of the operator and at moderate expense.

ACCESSORIES.

CASTORS.—To secure the *rotary movement* for such persons as desire it, legs have been cast, having recesses in the feet, into which Castors are inserted. The castors in the front legs roll laterally only, so that by them the patient's face may be turned to the light. When in the right position a locking device permits you to fasten the castors so that they cannot be moved until unlocked. The castors in the back feet are so placed as to revolve only back and forward, so that while they permit you to easily roll the chair like a wheelbarrow out of position if you wish to sweep, they cannot be moved by the force exerted in plugging a tooth.

NARROW BACK PAD.—To be used sometimes instead of the top pad, and sometimes as a third pad when the back of the chair is stretched to full length.

SPITTOON ATTACHMENT—see in the cut—is a cheap and convenient substitute for a separate spittoon. Is more convenient and costs less.

HEAD-REST.—The Morrison Head-rest is a *thoroughly* good one, and has given general satisfaction. It is supplied with the chair if we are not otherwise directed, and the price of the chair as named includes this rest. The Johnston Head-Rest is *our latest*, and is everywhere approved. It can be had with the chair at an extra cost of $8.00. It is shown in the cuts.

EXTRA UPHOLSTERY.

Turkish Upholstery.

Some persons having desired a softer style of upholstery than is usual in dental chairs, we have adopted, after many experiments, a modification of what is usually known as the Turkish chair. The seat is made about four inches higher in front than at the back, and both it and the lower back are made very soft by the liberal use of steel springs and hair, the edges being kept full by a piece of heavy spring wire which is built into the upholstery.

The perpendicular edges are covered with a puffing to match, and "set off" with handsome silk cord.

The arms and upper back pads are made heavier than usual, and are puffed and corded to match the seat.

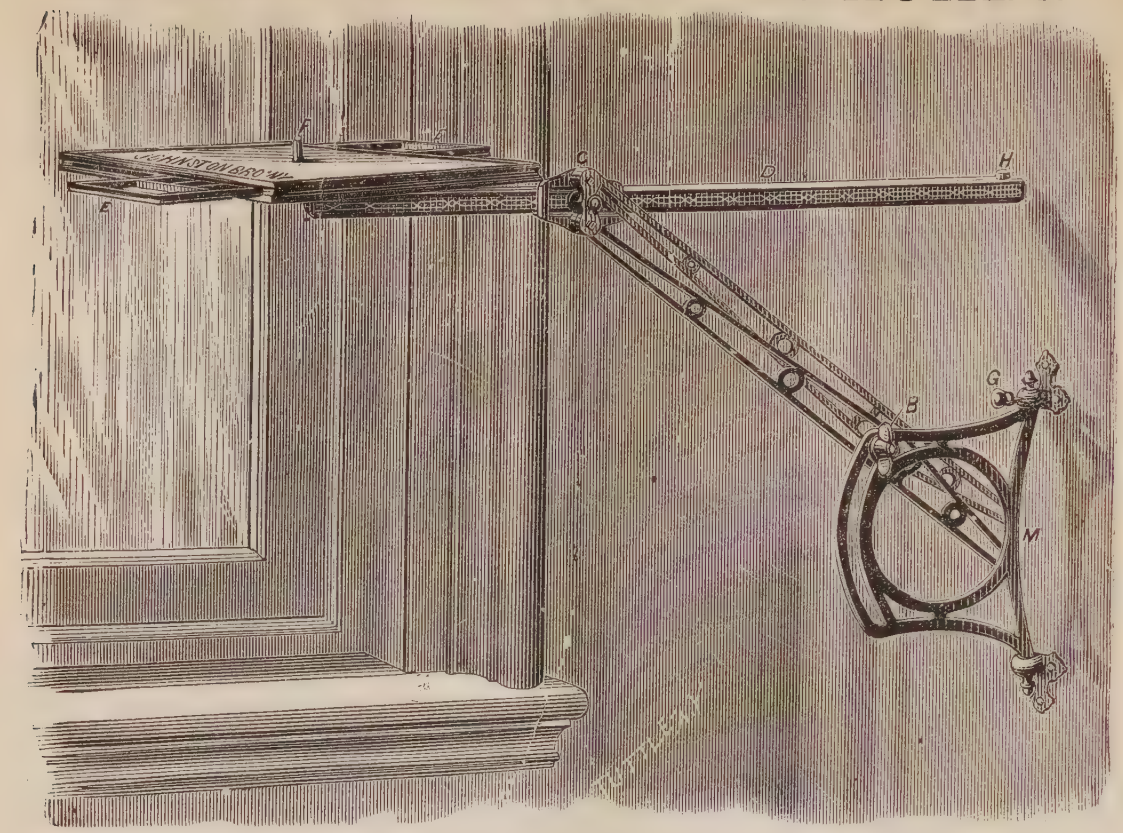
Real Morocco.

We also have produced a very elegant article by the use of real morocco, handsomely embossed. It is durable and particularly desirable for warm climates.

PRICES.

In fine green or garnet plush—with Morrison Head-rest	$ 150.00
Boxing	5.00
To which price add, if ordered:	
With Castors	10.00
With Johnston Head-rest, instead of Morrison	8.00
With extra back-pad	4.50
With spittoon attachment and porcelain cuspador	8.00
With nickled metallic cuspador and gold trap	10.00
With nickled metallic cuspador and gold trap, and nickled spittoon attachment	18.00
With Turkish upholstery	15.00
Real morocco embossed	10.00

MORRISON DENTAL BRACKET.



PRICES.

With Black Walnut Table, 12 inches square.....$25.00.
With Rosewood Table, 14 inches square, and Velvet Top, and Drawers about five-eighth inch deep, lined with Leather..... 40.00.
The Rosewood Table alone, as above, to fit any Morrison Bracket..... 17.00.
Boxing..... .....$1.00.

The cut represents the table in its highest position, and distant from the wall a little more than half the distance it is capable of taking. By loosening the thumb-screw B, and allowing it to rest in the bottom of the slot, (instead of at the top as represented here,) the table will occupy a position as much below M as it now does above the same point. The extreme range, that is, the distance between the table when at its highest and its lowest position, is 24 inches.

M represents a metal frame which is secured to the wall or other support by screws. It swings from side to side as a gate on its hinges. C. M. represent light but strong metallic arms, hinged at M as a centre and moving up or down. At B is a thumb-screw passing through a slot in the frame M. By it the arms can be firmly clamped at any desired height.

At C is a slide-rest through which the hollow rod D passes freely, and may be clamped at any distance from its ends. At one end of this bar a square table is supported, having in it foil and instrument drawers. This table is capable of rotation round F, which is the burner of an alcohol lamp, the alcohol being contained in D and introduced at its further extremity H. Among the advantages of this bracket are these:

1st. It combines a greater variety of range and movement than any other.
2d. It is rigid in whatever position it is clamped, and will hold 15 lbs. with steadiness.
3d. It provides a clean receptacle for foil and instruments.
4th. It is obvious that a square table is very much more convenient as an instrument stand than a round one.
5th. Its drawers extend through the table and can be opened from either side.
6th. To those having a Morrison Chair it is almost indispensable, as it will follow the chair to either its lowest or its highest position.

It is handsomely ornamented and nickel-plated throughout, so that it is a very beautiful addition to the furniture of the operating room.

JOHNSTON BROTHERS,
Broadway, cor. 32d St., N. Y.

HARVARD UNIVERSITY.

DENTAL DEPARTMENT.

BOSTON, MASS., 1878-79.

The plan of study of this School has been radically changed. Instead of the usual oral examinations at the end of the course, written examinations are had at the end of each year on the subjects pursued during the year, and instead of the customary repetition each year of the lectures and studies of the preceding year, the course is progressive over a period of two years, and the student is required to pass a satisfactory examination in the first year studies before being allowed to proceed to the next. At the end of the course a satisfactory examination must have been passed in all the subjects.

The new year begins Sept. 25th, 1878, and ends the last Wednesday in June, 1879. It is divided into two equal terms, with a recess of one week at Christmas, and another in April.

The University Degree, D.M.D (*Dentariæ Medicinæ Doctor*), is conferred upon those who fulfill the requirements.

FEES.

There are no fees for matriculation, for the diploma, nor for the demonstrators. For the first year a student is a member of the school, the fee is $200; for the second year, $150; for any subsequent year, $50.

For information address,

THOS. H. CHANDLER, Dean,

222 TREMONT ST., BOSTON, MASS.

FRENCH CROWN AMALGAM.

The Manufacturer says of it: The Amalgam is composed of materials which the dental profession at large recognize as the best (except gold) for filling teeth. It is of finest quality. It has the merit of becoming hard in fifteen minutes after being prepared for use, and does not change color or shrink.

PRICES.

1 oz. box, with mercury	$3 00
⅔ oz. " " "	2 00
⅓ oz. in envelopes	1 00

For sale at wholesale and retail.

JOHNSTON BROS., 1260 Broadway, N. Y.

JOHNSTON BROTHERS' LAVA STRIPS.

PATENT APPLIED FOR.

For finishing fillings, a new and unequaled polishing material.

Thinner, more convenient and more efficient than corundum tape.

Price, per Box. ..... 50 cts.

JOHNSTON BROS., 1260 Broadway, N. Y.

LIQUID NITROUS OXIDE.

N O

No other equally safe anæsthetic is known. While Chloroform and Ether are killing scores, if not hundreds, annually, Nitrous Oxide, although used many times as frequently as either of the other anæsthetics named, proves itself entirely harmless; and this too, though very commonly an impure article of Nitrous Oxide is exhibited. The Nitrate of Ammonia ordinarily furnished in the market is far from being chemically pure, and the products of its decomposition are too often impure Nitrous Oxide and Bin-oxide of Nitrogen. The latter is a gas of which the chemist, Brande, says:—"It is rapidly fatal to animals"—and again, (of the reddish fumes which result from its admixture with air, which fumes most dentists have seen while making Nitrous Oxide,) "These are fumes of Nitrous Acid, ($NO^2+2O=NO^4$). They have a peculiar suffocating odor, and are highly irritating and corrosive—*care should be taken that they are not breathed, even in a dilute state.*" All danger from this source may be avoided, however, by making use of *Liquid* Nitrous Oxide, which, being prepared constantly and in large quantities, under the direct supervision of a chemist, is certain to be pure. *No instance* of fatal results following the administration of pure Liquid Nitrous Oxide Gas is known. The following statistics, showing the comparative safety of several of the leading anæsthetics, have been before given by us, but cannot be too often brought to the notice of those who are constantly called upon to relieve suffering by means of these agents.

From a careful examination of the statistics of 200,893 cases, Prof. E. Andrews gives, in the *Chicago Medical Examiner*, the following estimate of the relative danger from different anæsthetics:

Sulphuric Ether	1 death to	23,204	administrations.
Chloroform	1 "	2,723	"
Mixed Chloroform and Ether	1 "	5,588	"
Bi-chloride of Methylene	1 "	7,000	"
NITROUS OXIDE	**no Deaths in**	**75,000**	"

Edward R. Squibb, M.D., than whom our country has no more able pharmaceutist and toxicologist, in a lecture on anæsthetics before the Medical Society of the State of New York, says: "Nitrous Oxide was the first anæsthetic; and the safety and certainty of its effects, even in inexperienced hands, for all momentary operations, and the promptness with which persons recover from its use, render it perhaps the most important of all anæsthetics, because destined to relieve a greater aggregate amount of pain, *with greater safety*, than any other agent."

Again—"If the surgeon considers the safety and saving of pain to his patient, first, and his own convenience in operating, second, he will hesitate before passing over such an agent as Nitrous Oxide."

It may be well just here to call attention to the fact that, when ether or chloroform is administered, it is not at all uncommon for the air about the patient to become so charged with the vapor as to somewhat affect the surgeon, taking from him perfect clearness of mental operation, and of the senses, and frequently leaving him with headache, and even nausea.

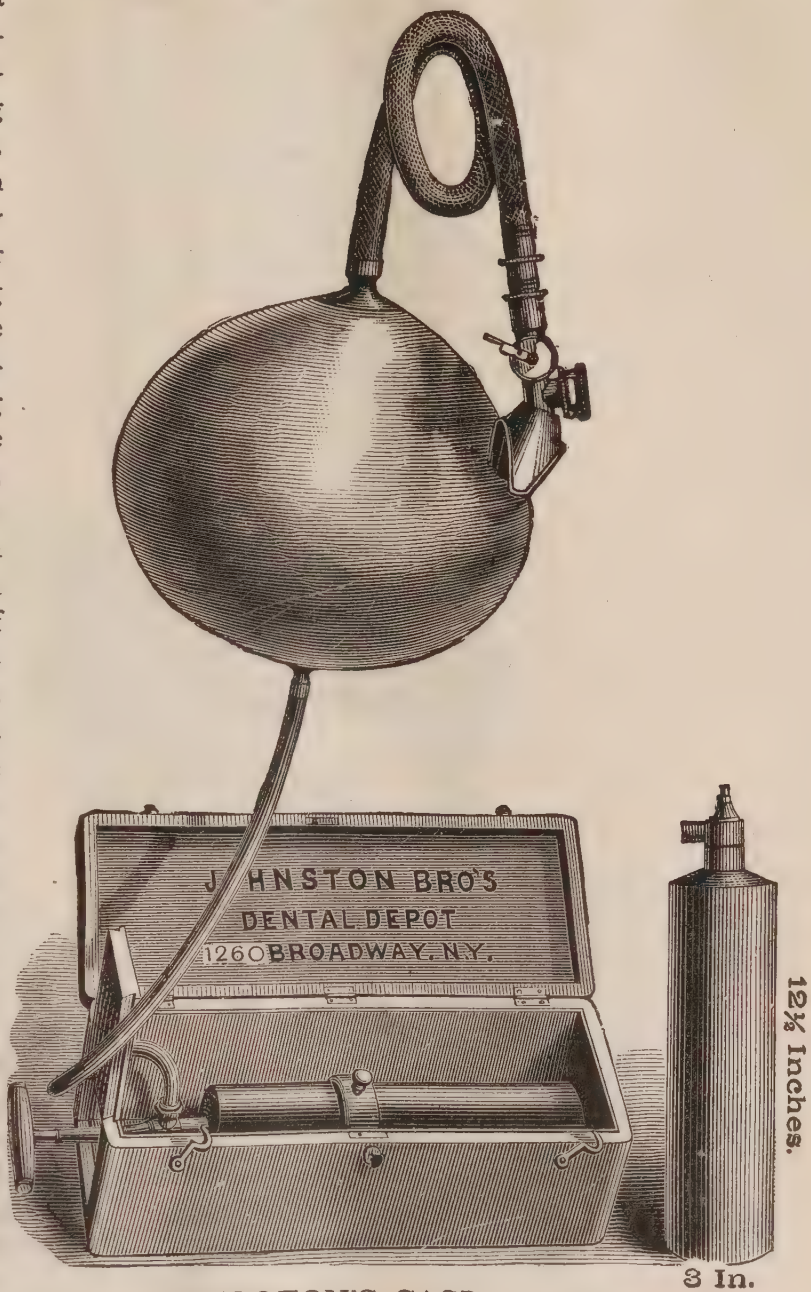
When Nitrous Oxide is given, nothing of this occurs, and the surgeon is in no way conscious of the presence of the anæsthetic, except as he sees its effects on his patient. This, we think, is a convenience to the surgeon.

Numerous and repeated trials of the Liquid Nitrous Oxide in capital operations in surgery, (as well as in momentary operations), during the two years just passed, attest the

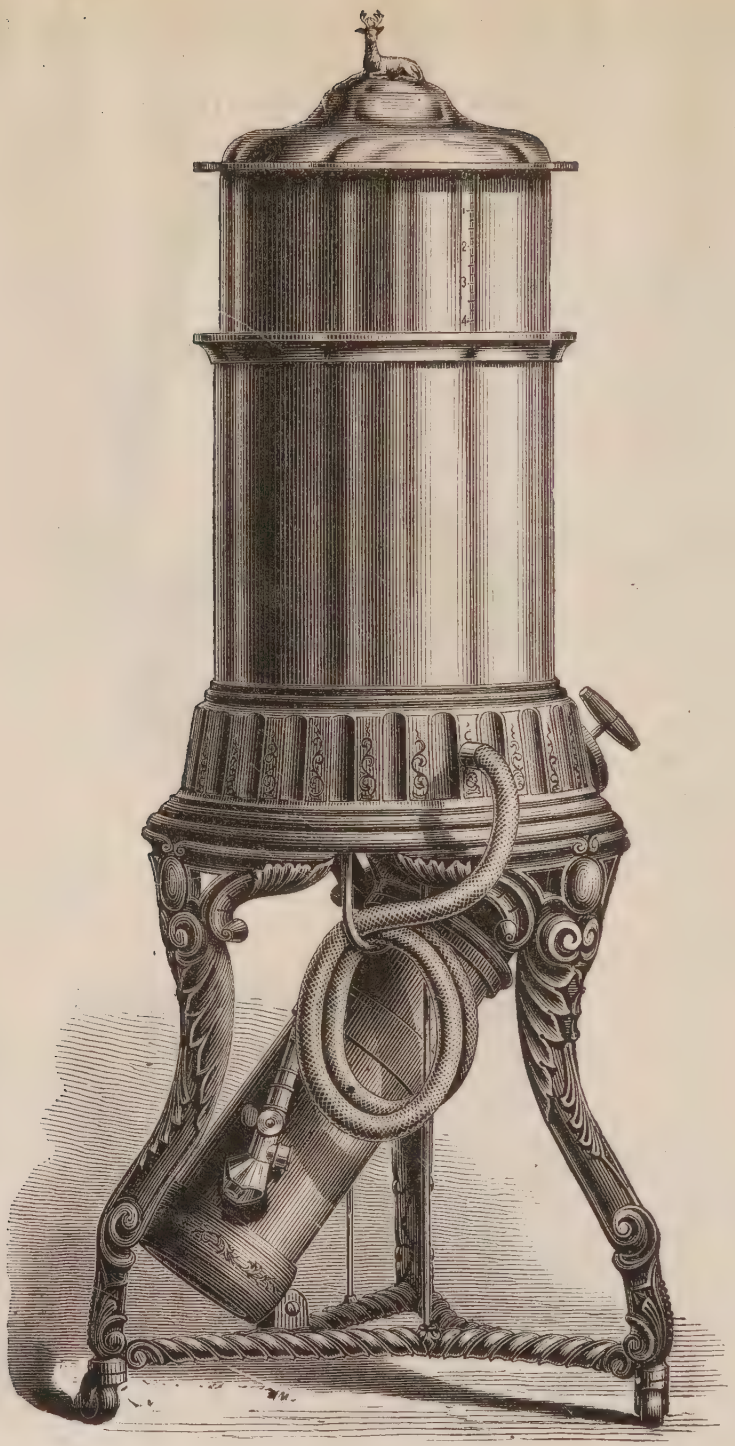
perfect adaptability of this agent to all cases where an anæsthetic is needed, and the time is not very distant when it will supplant its cheaper, but dangerous rivals.

Two styles of apparatus are provided for its administration. The most generally used, because of its cheapness and portability, is the SURGEON'S CASE.

This comprises a strong cylinder containing One Hundred Gallons of Gas; a strong morocco covered case, provided with an iron ring and set screw, by which the iron cylinder is held in place during use, and its delicate valve protected from injury; also, a rubber bag with rubber tube at one end for admission of gas, while an inhaling tube, handsomely covered on its outside, and provided against any possibility of a collapse by a tin-coated spiral of wire on its inside, is fastened at its opposite end; a metallic inhaler—nickled—having two spring valves, which answer to the slightest breath, either of inspiration or exhalation. The inhaler also has a two-way stop-cock or ground valve so arranged, that the gas being shut off, the patient may be allowed to breathe air until all alarm is dissipated, and then, by an unobtrusive movement of the fingers without previous notice, the air may be excluded and gas admitted. It contains also, a nickel-plated wrench and a nickel-plated key. In fact *all* the apparatus necessary for administering the gas. The whole case and contents weighs about fifteen pounds. This is here shown as open, and the bag which receives the gas from the cylinder, and from which it is exhibited to the patient, is represented as filled, and suspended above the case. The cylinder is also shown as standing at the side of the case. This is the simplest and most popular form of apparatus, and will be everywhere welcomed—because of its portability for use outside of the operating room.



SURGEON'S CASE.



NICKEL-PLATED GASOMETER

AND ORNAMENTED STAND

FOR LIQUID NITROUS OXIDE.

NICKEL-PLATED GASOMETER.

This style of apparatus is especially designed for those who use large quantities of Nitrous Oxide, or who may desire a highly ornamental piece of office furniture, coupled with a *really economical* gas apparatus, the gas being furnished in 1,000 gallon cylinders, at a reduction of 25 per cent. in price.

The cut on the opposite page represents the nickel-plated gasometer, mounted on a stand, with a 1,000 gallon cylinder, in position, under the gasometer.

Heretofore, gasometers have been so unsightly, that it has been considered desirable to place them in an adjoining room or behind a screen; we take pleasure now in offering to the profession a gasometer so handsomely gotten up, that it will be an ornament to any office, and at the same time so constructed, as to be vastly superior to any apparatus heretofore used. The gasometer will, when full, hold 10 gallons of gas —this is sufficient to completely anæsthetize any patient. The usual amount of gas given to a patient is from 3 to 5 gallons.

If it is desirable to keep the patient under the influence of the anæsthetic for any length of time, (as in a surgical operation), the operator has under his control 1,000 gallons of gas, by merely turning the key seen in the cut at the right. The gasometer is nickel-plated, highly polished, and mounted on a carved iron stand, which is japanned and ornamented with bronze.

On the bell of the gasometer there is a scale graduated in gallons, and fractions of a gallon, so that the operator can readily see how much gas he has administered.

Another valuable feature in this gasometer, is a peculiar water-check or valve, so arranged that though the gas will flow freely on the lightest inspiration at the inhaler, it is instantly and automatically shut off by the water when the patient stops breathing.

This does away with the necessity of closing any stop-cock, and prevents all waste of gas; it also saves the dentist's time at the most critical moment, as he has only, after having administered the gas, to lay aside the inhaler and proceed at once to operate without the necessity of shutting any stop-cock. The stand is so constructed that a small (100 gallon) cylinder can be used while the large cylinder is being re-filled.

We should also call attention to the fact, that there is no liability to loss of gas from leakage, caused by the operator's leaving the valve of the cylinder open, for if there is such escape from the cylinder, the bell of the gasometer will rise, and the operator will have his attention called to the waste, thus enabling him to correct the difficulty at once.

The whole apparatus is mounted on castors, and can be readily moved.

This apparatus is especially desirable where large quantities of nitrous oxide are used, or where it must be sent a great distance. In this form it is best to ship it by *fast freight*—which makes the cost of transportation very light. The gas can be kept for any length of time, and is constantly on hand *and always of the best quality.*

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.

Why Nitrous Oxide should be preferred to Ether or Chloroform.

1st. It is far safer—see foregoing statistics. Dr. Colton reports having administered it to thousands of patients, without a single accident.

2d. It acts quickly ; from one to two minutes being generally sufficient to bring a person completely under its influence.

3d. It seldom excites a patient to violence—a matter of great importance.

4th. Nausea is not often excited, even during a long operation. Eating, however, should not immediately precede the administration of the gas. It is contended by some operators of large experience, that *pure* nitrous oxide *never* causes nausea. In operations of the eye, or in the pelvic region, this peculiarity renders the gas invaluable, and it always is of much value to the patient's feelings.

5th. The shock given to the system by other anæsthetics, is almost as severe as the operation itself, and a slow return to consciousness and the normal condition detrimental to the recovery of the patient. Nitrous Oxide frees itself from the system as speedily as it produces its effects, and so adds nothing to the perils of surgery.

6th. It is no small advantage, as before recited, that, while using Nitrous Oxide, the operator feels no inconvenience from its effects, as he does not inhale it, while he cannot altogether escape the fumes of ether or chloroform.

REVISED PRICES.

Complete Apparatus—Surgeon's Case, with Metallic Inhaler	**No. 1**	$42 00
Complete Apparatus—Surgeon's Case, with extra sized Bag and Metallic Inhaler	**No. 2**	44 00

Boxing either, $1.00.

Each complete apparatus includes a 100 gallon cylinder, filled with Liquid Nitrous Oxide.

Cylinder with 100 gallons of Gas	16 00
Refilling Cylinder	6 00
Nickel-Plated Gasometer, with ornamented iron stand	128 00
Necessary adjuncts, (including Union Nut, Key-Wrench, Inhaler and covered Tubing)	12 00
1000 Gallon Cylinder	36 00

The above cylinder may contain more than one thousand gallons—say from 1000 to 1200 gallons—for which the price will be at the rate of 4½ cents per gallon, which is 25 per cent. less than the price in small cylinders.

Contents, if 1000 gallons would be, at 4½ cents	45 00
Morocco covered case, with ring and thumb screw, velvet lined	12 00
Polished bl'k walnut " " " " "	13 00

Or these latter we have only a limited number.

Rubber Bag, with covered inhaler tubing, (about 4 gall. capacity)	5 00
Rubber Bag, with covered inhaler tubing, extra size	7 00
Inhaler, latest style, with two way stop cock, adapted to the use of both dentists and surgeons, with connection	9 50
Key, Nickel Plated	1 50
Wrench, "	50
Union, Nickel Plated, (nut and tube), for connecting cylinder and gas bag	1 50
Covered Inhaler Tubing, per foot	50
Plated Connection to fit old style Inhaler	1 00

JOHNSTON BROS.,

Broadway, cor. 32d St., N. Y

NITROUS OXIDE GAS.

100 GALLON CYLINDER TRIPOD.

PRICE, $4.00.

We here show a representation of a tripod, handsomely japanned and ornamented, which is designed to hold the cylinder while in use, and is less expensive than the Morocco case, of the Surgeon's case.

Price adapted to 100 gall. cylinder.....$4.00.
" " " 500 " " ..... 6.00.
" " " 1000 " " ..... 8.00.

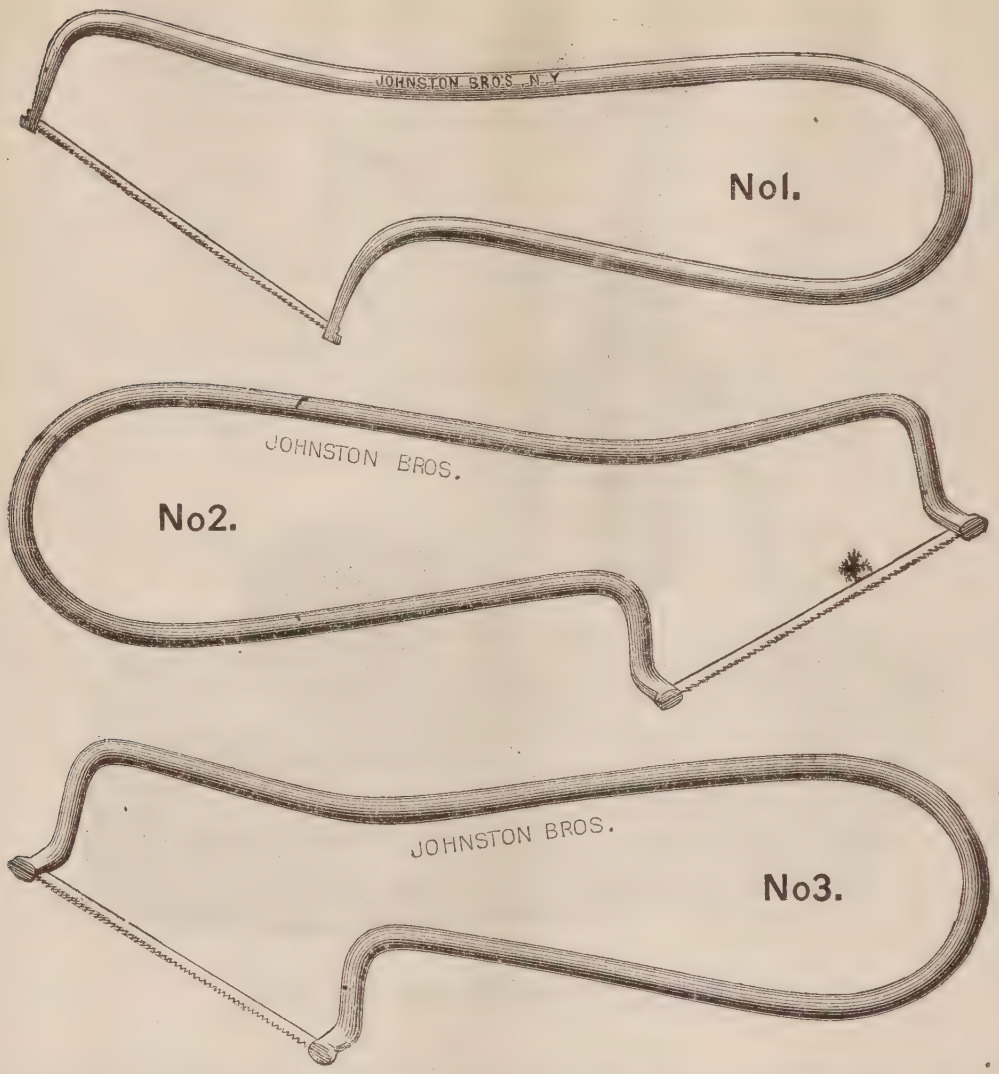
ADJUNCTS NECESSARY WITH EITHER TRIPOD, VIZ.,

Bag, Inhaler, Key, Union-Nut and Wrench..... .....$17.00

For other prices of Gas apparatus, see pages following.

CLAPP'S SAW FRAME.

PATENT APPLIED FOR.



In the form shown here this instrument, the device of Dr. Dwight M. Clapp, will be found very useful as a saw frame. The saws are firmly held in place, but can at pleasure be detached or inserted by pressing the wires of the handle together, the thumb being placed just beyond the extremity of the saw, on the handle, for that purpose.

These saws are in many cases superior to files in finishing fillings. Being much thinner than any file, they will pass between teeth, leaving less space (a thing often very desirable, particularly at the cutting edges of the teeth), yet sufficient to be followed by emery cloth or tape.

The saw can often be used between teeth that are crowded, where a file cannot. The saw being flexible—hard enough to cut the gold but not the teeth—will follow the space between, although it be quite irregular. It will cut much faster than a file and is less liable to break.

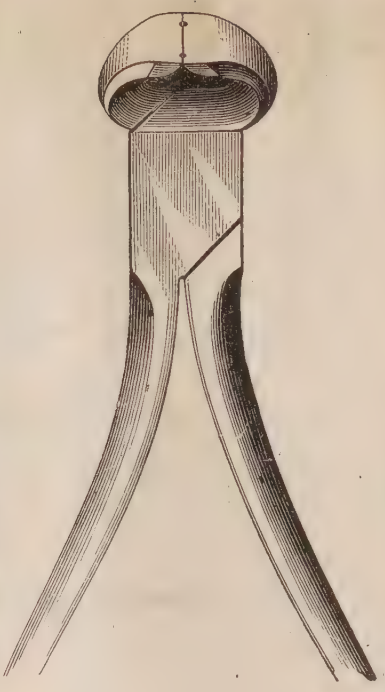
PRICES.

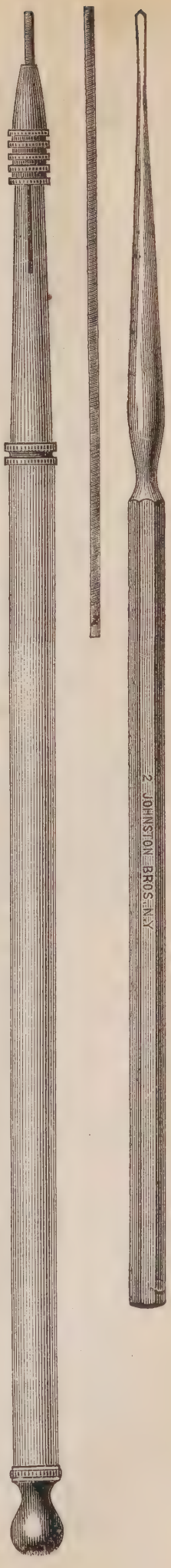
Saw Frame	50 cts.
Saws, per dozen	25 "
Frame and two dozen saws, postage paid	$1 00

JOHNSTON BROS.,

1260 Broadway, cor. 32d St., N. Y.

Morrison's System of Retaining Screws.





Dr. W. N. Morrison, of St. Louis, has furnished us models of his drill-taps and adjustable wire-holder, and gold wire, from which we have reproduced similar instruments or apparatus for the profession.

No especial description is needed in view of the thorough work of our artist. It may be well to call attention to the following facts: The drill-taps and wire fitted for each other bear corresponding numbers, as, 1, 2, 3.

The adjustable wire-holder takes either size of wire.

The cutting plyers are provided with two round openings in their cutting face. The long wire to be used if put in one of the openings can be "nicked" at the proper distance to form the screw while in the wire-holder, so that after having been screwed into place it may readily be broken off, without the use of file or plyers in the mouth.

In the above numbers of Drills, Taps or wire:
No. 1 corresponds to Mack's No. 0.
No. 2 " " No. 3.
No. 3 " " No. 1.

We make no number corresponding to No. 2 of Mack's system, it being very nearly the same size as No. — of Morrison's system.

PRICES.

Complete Set, including three wires, 3 inches long, with morocco case ..... $12.00.
Wire-holder, nickel-plated ..... $1.50.
Drills, each ..... 50 cts.
Taps, " ..... 50 cts.
Nippers, nickel-plated ..... $2.00.

	No. 1.	No 2.	No. 3.
Gold rods, each	$1.50	$1.20	$1.00.

JOHNSTON BROS.,
Broadway, cor. 32d St., N. Y

SUSPENSION DENTAL ENGINE.

(INVENTED BY DR. W. S. ELLIOTT.)

The Dental Engine represented in the accompanying plate is confidently recommended by us as sure to give general satisfaction.

Two or three years ago a few engines modeled on this, the Elliott, plan (suspension from the ceiling) were sold. Though imperfectly constructed, they have been uniformly commended by those who have used them.

Each of the two styles of Dental Engines which have found favor with the profession has advantages peculiar to itself.

In this form the driving power is belted directly to the shaft of the hand-piece, without the intervention of a flexible joint, and so *entirely avoids all the unsteadiness* or "chattering" which is almost inseparable from the flexible joint, even when short, and is unendurable where the non-rigid portion is long.

The Remodeled Engine, shown in our cut, has not only greater elegance of design than the Suspension Engine as previously sold, but, by its construction, obviates several objections to which the earlier model was liable. It was previously necessary to make the hand-piece large and heavy in order to give tension to the belt, and in furtherance of this purpose a considerable ball of metal was suspended from the rear of the hand-piece. As now made, the ball weight is dispensed with, the hand-piece being balanced and tension given to the driving-belt by placing a small pulley on the hand-piece spindle. The hand-piece is reduced to half its original weight, *and the slightest movement at its point can now be felt by the hand which guides it.* Among its advantages, those subjoined are prominent.

1st. It is more steady in its movement than any Engine made.

2d. Being suspended on a cord, it is free to move in any and every direction—hence the bur can be readily applied to any cavity, whatever may be its position in the mouth.

3d. It has an abundance of power.

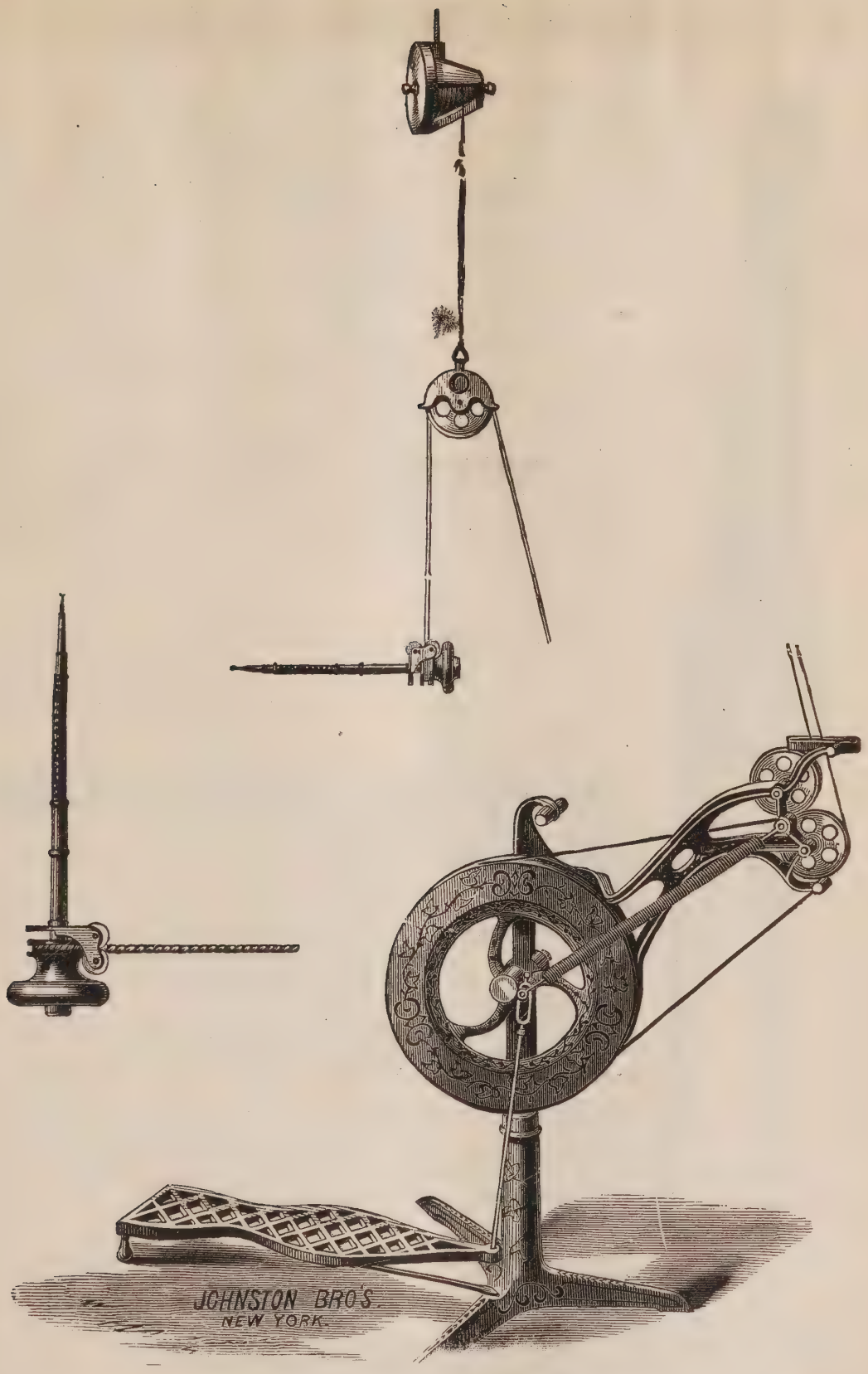
4th. It is not easily broken or likely to need repairs.

5th. It is, above all others, a "*light running*" Engine.

6th. The hand-piece, which formerly was particularly objectionable because of its size and weight, and because of the position occupied by the weight needed to balance it, is now scarcely larger than that of the Morrison Engine, and is fitted to use the same (C style) bur. For the balance-weight we have substituted *a fly-wheel on the shaft which carries the bur.* While keeping the hand-piece well balanced, this gives momentum and greatly increased steadiness to the cutting instrument.

Orders for this Engine will be entered in rotation as received, and promptly filled.

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.



SUSPENSION DENTAL ENGINE.

(Dr. ELLIOTT'S INVENTION.)

Price, $50.00. Right Angle Attachment, $5.00. Boxing, $1.00.

FOIL TWEEZERS.

A thoroughly made article. They can be had with straight points as represented above, or with curved points. Prices :

Plain.....$1 00

Nickel Plated..... 1 50

JOHNSTON BROS.

WOOD STRIPS.

Cotton Wood, per bundle.....20 cents

Box Wood " " .....12 "

Orange Wood " " .....10 "

JOHNSTON BROS.

DENTAL PICTURES.

Pictures on Dental subjects are not very numerous, and will always possess interest to practitioners of dentistry. Having reproduced several copies of ancient paintings and engravings, illustrative of dentistry in other countries and in olden time, as frontispieces for the DENTAL MISCELLANY, we have, at the request of friends, also printed them upon plate paper, in suitable form for framing or for preservation in a portfolio.

Those now ready are—

1. Der Zahnarzt—From a Steel Engraving of 1672.
2. The Tooth Drawer—English.
3. The Monkey as a Dentist—From a painting by DeCamps, 1840.
4. Der Zahnbrecker—From a German Plate.
5. Transplantation—1787. By Rowlandson.
6. The Ludicrous Operator. By J. Harris, London, 1768.
7. Primitive Dentistry. Scene in Persia by an eye witness.
8. Fifth Pair of Nerves—not colored. From Tomes' Dental Anatomy.

Price each, by mail.....50 cents.

JOHNSTON BROS.,
Broadway, cor. 32d St., N. Y.

JOHNSTON ADJUSTABLE FOUNTAIN SPITTOON.

The defects of the Fountain Spittoons hitherto made are, that it is almost impossible to keep them from leaking, and that they occupy a rigid position close to the left of the chair, and hence prevent the operator from working on that side.

These defects will not be found in this spittoon, which is commended to the favor of Dentists by the following points of merit:

1st. It is readily adjustable to the position of the chair; that is, it can by an easy movement of the hand be raised or lowered to suit the height at which the chair is placed at the moment.

2d. The normal position of its base is, say, eighteen inches to the left side of the chair, from which position its basin will ordinarily be inclined towards the chair and patient; but should the operator desire to stand on that side of his patient, the standard of the spittoon can be instantly inclined in the opposite direction, so as to be entirely out of the way

3d. Instead of a wooden case, twelve inches square, is an ornamented metal tube one and a half inches in diameter, which will not warp, occupies very little room.

4th. Movable joints are so arranged that any leakage is impossible, since the waste from the bowl never comes to the joint itself, but is discharged below, in the bottom of the lower half of the socket of the globe, and conveyed into the waste pipes.

5th. It is provided with a gold trap, and an operator of good practice now using the ordinary spittoon will be able to save enough gold in from one to two years to entirely reimburse himself for this purchase.

6th. All its bright parts are of gun metal, and its tubing silk covered.

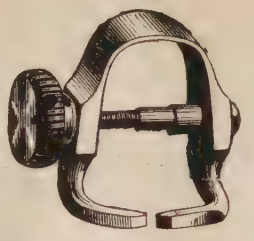
The water jet used is the device of Dr. Redman, of Louisville, Ky.

Price. $60.00
Boxing..... 2.00

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.

Jarvis' Separators.

(PATENTED SEPT. 8, 1874.)



PRICE REDUCED.

The cuts above shown are full size, and represent an apparatus for separating teeth. It is almost impossible to overstate the value and convenience of the devices. By their use, without delay to the operator or appreciable pain to the patient, adjacent teeth may be forced apart for any of the various purposes for which it has been customary to wedge teeth. Crowded teeth can be readily parted by using the separators, so that rubber dam can be applied without difficulty or loss of time. Two forms are shown by the cuts; of the first form we make three sizes, **No. 1, No. 2,** and **No. 3.**

The Separator consists of a piece of steel, nickel-plated, bent upon itself, having the two ends formed to fit the outer portions of the proximate surfaces of two adjoining crowns.

These jaws are forced apart by the action of a screw, which passes through one and against the other of them. This form is applicable to all the bicuspids and molars. It does not touch the gums or injure the teeth, neither does it cause pain sufficient to be of consequence.

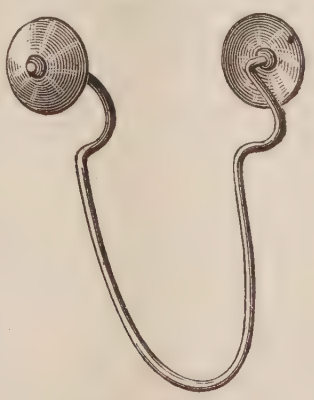
The Compound Wedge, No. 4, consists of two wedges approaching or passsing each other. This is especially applicable to the incisor teeth, and will be found particularly useful in making room for passing rubber dam around crowded teeth. In use, a small strip of wood should be placed over the teeth and beneath the cross-bar, to prevent the points from sliding towards the gum.

PRICES.

Complete Set of Four	$4.00
No. 4	2.00
Nos. 1, 2 or 3, singly	1.00

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.

Elliott's Cheek Distender.



Cut is $\frac{1}{4}$ size.

This convenient device, as its name implies, is designed to distend the cheeks of a patient during operations on the teeth.

Its bow of spring wire, and the cheek pieces are polished and nickel plated. It serves, in connection with its principal use, to reflect light on the teeth. As the spring is not stiff it is worn with very slight inconvenience. *This is proving extremely popul ır.* Price $1.00.

JOHNSTON BROS,

Broadway, cor. 32d St., N. Y.

NEW YORK COLLEGE OF DENTISTRY,

1877–78.

FACULTY.

FANEUIL D. WEISSE, M.D., Professor of Regional Anatomy and General Pathology.

FRANK ABBOTT, M.D., Professor of Operative Dentistry, Oral Surgery and Dental Therapeutics.

ALEX. W. STEIN, M.D., Professor of Histology, Visceral Anatomy and Physiology.

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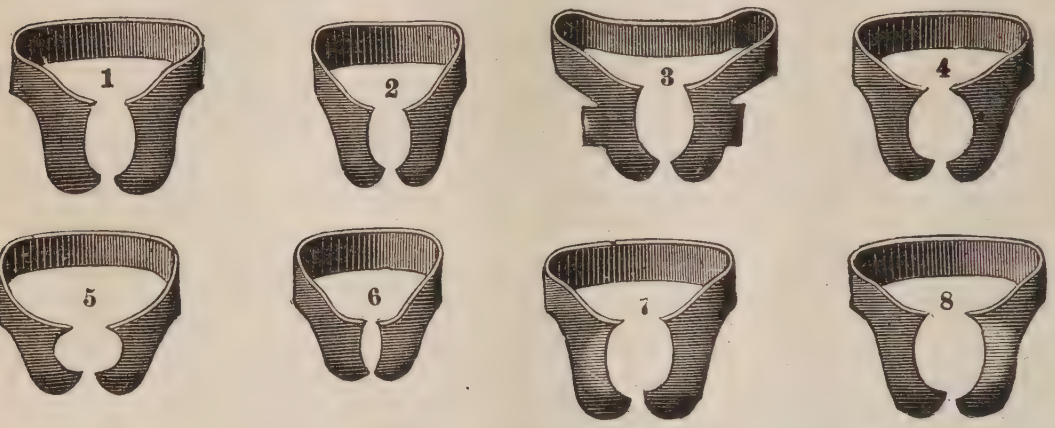

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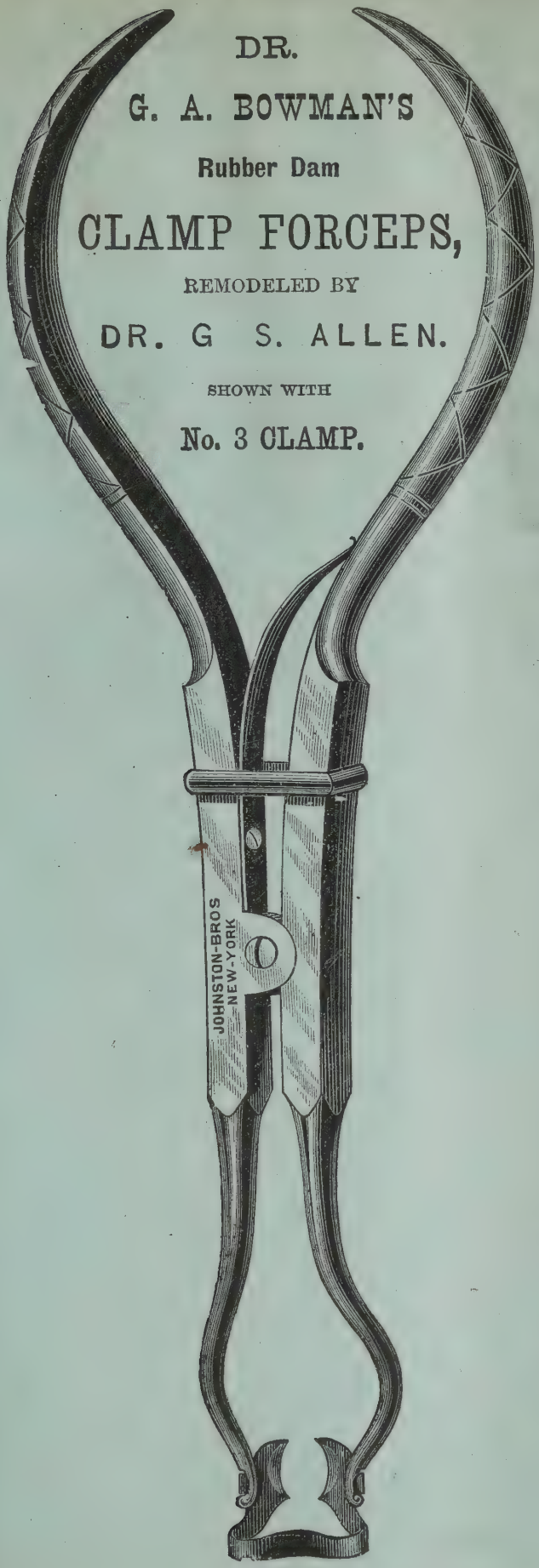

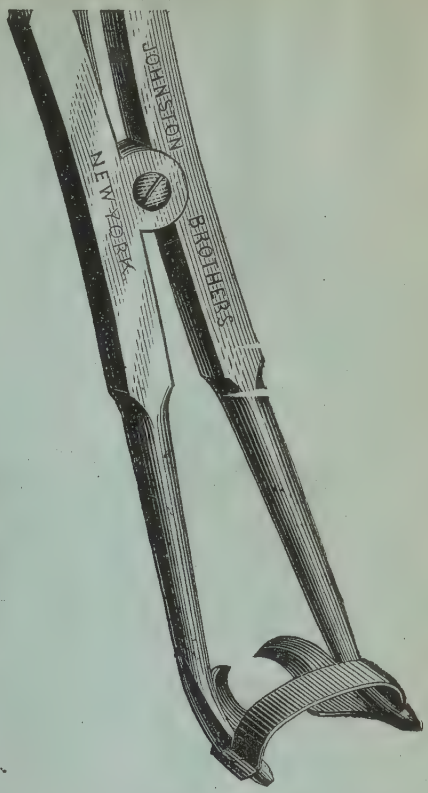

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AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL AND MECHANICAL LITERATURE.

MAY, 1878.

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JOHNSTONS'

Dental Miscellany.

VOL. V.——*May, 1878*——No. 53.

ADDRESS BY DR. J. LEHMAN EISENBREY, OF PHILADELPHIA, PA.

Read before the Alumni Association of the Philadelphia Dental College, Feb. 27, 1878.

GENTLEMEN,—I will not detain you long, for fear you will fret under the infliction, nor will I introduce a subject relating to your professional studies of the past two years; not that I think the subjects can now be exhausted, but because I think it would be a pity to bring any one of them up on this your gala day. If you play your parts when you get to your homes as religiously as your instructors have while you have been here, you will do what I would have you to do—study and be true to yourselves. Leisure hours—how will you employ them? That is the question that now rises up before you in all its importance; I say important, for on the manner in which you employ your leisure hours depends the entire success of your future professional and social career.

Gentlemen, you will notice by these introductory remarks to my brief talk to you, that I have in my mind the recent graduates and those that expect to graduate in the future.

My reason for so doing is this: Those already in practice have found, from experience, wherein they have made mistakes, and how to rectify them, as well also, that every thing depends on the man; hence I leave them to regret the past and improve the future. We all have our regrets.

Man, in a measure, is a free agent, who has it in his power to lay a good, broad foundation, on which to build his future reputation, or to work for a reputation, thinking to place the foundation under it after the structure is started. The foundation I allude to is knowledge of a sound professional and social kind. In the one case he is backed up with a thorough understanding of the subject, or subjects that can be demonstrated by works, and in the other he trusts to luck or a happy combination of circumstances to not test his ability too far and show his weak points. The one that trusts to circumstances alone will find before long that the waves of professional life beat and surge hard, and will soon wash out his props and bring his structure down on the sands, and even into them, from which point it is harder to rise again than was ever dreamed of; while in the other the waves will break and roll by harmlessly, leaving him master of the professional and social sea. Now, which will be your selection? After receiving a notice of having passed your examination successfully, there comes over you a feeling of quiet happiness, and rest—a loosening of the tension of your mind that is quite comfortable, and also, if I may be allowed the expression, a disgust for books. The latter feeling is quite natural, but I sincerely trust you will only allow it a temporary lodgment in your mind.

The race has been run and the goal reached, and now for practice, you say. I say, now for your leisure hours, and how shall they be employed? "God helps those that help themselves," and the community helps those Dentists that help themselves, and is ready to reward them. Do not wait for patients to come in to give work to your hands and mind, but make work for yourselves—work, that in the future will prove to have been your best investment. Thus, take down your dusty books, open and resume again your studies, each in order, and for a short period at a time, the change from one to another will be a rest. You will find a newness in them that will surprise you, owing to your new condition and relation to your patients and to society. As you have been students in the past so keep yourselves students in the future. There was so much to be learned in so short a time here, that, in a measure, it was only memorizing your studies, the later lessons crowding out or covering up the previous ones. Your knowledge, even now, is as it were hanging on the outer branches of your brain tree, and will require continued reading and study to drive it into the trunk and roots so as to be retained and kept yours forever. This does not sound very complimentary after two years hard study, you may think; but let me say this by

way of apology, if you do not keep up your studies with the same fidelity that you have done here in the past two years, in less than five years you'll be surprised at your own rustiness. As I remarked, your knowledge is quite on the surface yet, and it will take some hard knocks before it will become thoroughly driven in and incorporated in your mind, Do this and then you will be ever ready to demonstrate by works the instructions you have received while students. How better can you employ your leisure hours than by keeping yourselves posted in general treatment, as well as special cases cited in your text books? Then when special cases are presented to you, you are at once able to make a correct diagnosis and give advice and treatment intelligently. You are strong in your knowledge, and your confident manner begets confidence in your patients. Aim to fit yourselves to treat an antral abcess, remove necrosed bone or a tumor, as well as to extract, or treat and fill an aching tooth.

Your surgery should be an especial study, for under this head comes your treatment of necrosis, hemorrhage, arsenical poisoning, fractures, abscess, tumors, &c., to say nothing of unbearable attacks of neuralgia occurring at stated times; and also bear in mind that back of all this your patients may require systemic treatment in connection with local, so do not neglect your principles and practice of medicine.

"Too much study is wearisome to the flesh," so says an eminent writer. True it is too much of anything is bad, so not to have too much of any one thing I would say go in your laboratory, hammer out, shape and temper all your instruments and make others to meet special cases. If you have not learned to do it here, much is it to be regretted and much loss is it to you; then, set up old teeth in plaster or a vise, and assuming them to be the mouth, take your position and prepare and fill them—using tin foil—do it with the greatest care and honesty possible; it will pay you tenfold to do it—for every operation performed out of the mouth in this manner makes an actual operation in the mouth twice as easy. The most complete arrangement is to have a skull, with teeth in position to work on; for filling a tooth out of the mouth with good light and favorable position is one thing and to do it in the mouth another. Then, if you have a few mechanics tools, you can make many things for your office and laboratory whereby a great saving can be made, and with the addition of giving you good exercise. Now, with your office studies and laboratory work, mix in general reading—"variety is the spice of life," you know. History, philos-

ophy, science and novels, the latter generally termed light literature, are most desirable as a change for the relief and rest produced on the brain. I mention this variety of reading to you knowing full well that the broader base you have for your general information the better and more earnest Dentists you will make of yourselves—for it begets ambition. I have now given you a glimpse of the path to pursue that will lead to success. Will you take it, or, will you settle down and vegetate, and Micawber like, "wait for something to turn up?" Life is too short to spend in idleness, and it requires more talent to kill time than to improve it.

Better die in harness than to rust out. Knowledge is power.

I would have you follow out my suggestions for two reasons, viz: being occupied all the time gives you an air of business, which your friends and acquaintances do not fail to notice, and which will inevitably draw you patients, for the community is ever ready to help them that appear prosperous, and also it makes you strong in knowledge, a more worthy citizen, and enables you to occupy a higher plane in society. Knowledge is a power that masters physical force. I would have you be great thinkers, study cause and effect, debate pro and con any subject that comes before you, and come to some definite understanding of the why and of the wherefore. If you have a tooth to extract, or to treat and fill, a chronic abscess to treat, or an operation on the jaw to perform, do it in your mind from beginning to end once, do it twenty times, and then when you have it to do in reality it will have been robbed of all its formidableness, and it will beget confidence. Suppose we have no patients, you say, on which to operate, then I say make imaginary patients with all kinds of dental trouble and complications, and operate on them; that is what your brains are for, and that is what will make you worthy children of your Alma Mater. I say think and think—do this while walking along the street, over the hills, while sitting in your easy chairs, or while lying in bed; the latter time of all is the best, for then you are isolated from all surrounding objects that would distract, and your ability to concentrate your thoughts are greater. Do this, and complicated cases will become simple ones, and both patient and operator will be rewarded. Concentration is the secret of success.

Now, gentlemen, these, your leisure hours, I have made the most busy ones, and I have shown you how I would have you employ them, and for your own sakes heed what I have said; while they may not be directly remunerative, they are equally important as though your fingers were

busy at the chair or in your laboratory ; at any rate how better can you employ them.

Gentlemen, we, the older children of our Alma Mater, meet here yearly, to renew our college acquaintance, and to wish each other well ; and we also meet here to welcome and congratulate you, our younger brothers (whose laurels are yet fresh), wishing you a succcssful and profitable professional career and a safe return to your homes and your duties. May you all honor our profession.

THE POISONS OF THE INTELLECT.

BY CHARLES RICHET, IN "REVUE DES DEUX MONDES."—1877.

(Translated by PROF. THOS. H. CHANDLER, *Boston.)*

Continued from page 132.

Alongside of alcohol must be placed chloroform. From a phyisologic point of view the action of these two poisons is nearly the same, and, if the use made of them is very different, their function is almost identical.

Chloroform is a colorless, volatile, aromatic liquid, denser than water and not mixing with it. It was discovered by Soubeiran, in 1831,* and his process of obtaining it is still employed. It is sufficient to distill alcohol with the hypochlorite of lime and slaked lime. The hypnotic properties of chloroform were discovered by Flourens in 1847, only a few months after Jackson had discovered in ether analogous properties ; but the first surgeon who employed it in an operation upon mankind was Simpson, of Edinburg, in November, 1847. Since this period its use has become so general that now-a-days no grave operation is performed without an anaesthetic ; therefore, the discovery of surgical anaesthesia is justly regarded as one of the most valuable of this age already so fruitful in its gifts.

The principal action of chloroform is paralysis of sensation, or anaesthesia. It is thus that it acts upon the intellect, for sensibility is only one form of intelligence ; but this point, as yet rather obscure, deserves

* Chloroform was discovered by Samuel Guthrie, of Sackett's Harbor, N. Y., in 1831. See "Silliman's Journal," Jan., 1832, p. 64. *Ibid.*, July, 1832, p. 105. Also by Liebig, in Germany, and Soubeiran, in France, at about the same time—an interesting instance of the frequent simultaneousness of discoveries and inventions by distant and independent discoverers.

to be cleared up. Two great functions are entrusted to the nervous system, sensation and motion ; through sensation we receive impressions from without, through excitation of the muscles, or motion, we make known our will and act upon external objects. Where there is no disease, nor poisoning, the will, that is to say the intelligence, excites, through the intervention of the spinal cord, the different muscles and produces motion ; but this condition is not absolutely necessary, since in decapitated animals, for instance, the nervous system of the spinal cord may still produce movements in the muscles. There is motility but no longer sensibility. There is sensibility only when the intelligence is intact and capable of perception ; so that a being without intelligence cannot be capable of perception. Pathologic observations sustain this view ; whenever there is disturbance of the intelligence there is at the same time disturbance of the sensibility, and reciprocally. Also, whenever we see a sick person showing noticeable troubles in his sensibility, if the nerves are intact we may be sure that the central nervous system is injured, and injured in such a way that the intelligence is not unharmed. Comparative anatomy and physiology are in accord with pathology. There are animals having little or no sensation ; these are inferior animals ; their intelligence is obscure and their sensibility as obtuse as their intelligence. On the contrary, in proportion as animals of greater intelligence are observed, the sensibility is seen to become more and more delicate, until man, the most intelligent of all, is found also to be the most sensitive, and, even in the different human races, the races most endowed with intelligence are also those whose sensibility is the most perfect. The anatomic disposition of the nerve centers is in relation with this coincidence ; it is in man that the posterior cords of the spinal marrow are the most voluminous comparatively with the anterior cords. Now, the anterior cords transmit the motor excitations to the nerves, whilst the posterior cords serve to conduct sensitive excitations ; in like manner the posterior lobes of the brain are, relatively to those of animals, more developed in man than the anterior lobes. Now it is in the posterior lobes that the perception of sensitive excitations seems to be formed.

This strict relation between intelligence and sensibility is nothing that should surprise us. In fact, whatever may be the influence of the spontaneous development of the intelligence, according to the intimate constitution of the brain, its organ, it is none the less true that all our knowledge comes from our sensations and the cerebral action resulting

from them. The intelligence is in some sort the product of these two factors, and the exterior notions, elaborated and fructified by the spontaneity of the spirit, or the personality of the individual. We have, therefore, the right, when we see anatomy, physiology and pathology establishing between sensibility and intelligence a strict relation, to say that psychology consecrates the positive data supplied by these three sciences.

The poisons that act on the intelligence are, therefore, and for this reason, poisons of the sensibility. Alcohol in this differs in no respect from chloroform. At the beginning of intoxication there is already a noticeable insensibility ; but at the comatose period the insensibility is absolute, just as at the last period of chloroform, so that intoxication by chloroform follows a road parallel to intoxication by alcohol, and a first period of drunkenness, properly so called, may be distinguished, and a second period of sleep, or of coma.

When chloroform is respired the first inhalations begin by stupefying, a sort of vertigo and of daze come on that are very disagreeable. This vertigo increases, and in proportion as the patient continues to breathe the toxic substance his ideas become more and more exalted. He hears and answers all that is said—but he answers like a drunken man—exaggerating his expressions at first, and carrying them beyond bounds ; his judgment has already gone, and he gives to the most insignificant replies a theatrical accent which often has a very grotesque effect. Afterwards, his ideas become more and more confused ; will and judgment no longer exist ; the conception of ideas left to itself becomes disordered and delirious ; in a word, he is asleep and dreaming, almost like what takes place in ordinary sleep.

Perhaps it will not be inappropriate here to review in a few words the physiological facts of sleep. The person who is awake is perfectly master of himself ; he carries his thoughts and directs his conceptions in whatever way he pleases, whilst ideas of every sort pass and repass before his will ; he can, when he will, pause and fix his attention so as to preserve faithfully the memory of whatsoever he selects as worthy to be remembered ; but when sleep overtakes him this power disapppears ; the ideas become more fleeting, more rapid ; it is impossible to make them pause ; judgment is no longer there to rectify the ceaseless conception of disordered and tumultuous imaginary forms, and unreasonable, absurd, fantastic ideas succeed one another without pause ; the more unreasonable they become the weaker become attention and memory,

and we cannot seize the mathematical moment when consciousness disappears. I beg my reader to make the experiment with himself and try to recall the thread of his conceptions at the moment of falling asleep. He will see that we never drop to sleep suddenly, and that the first effect of sleep seems to be the loss of attention and of will. The conception and association of ideas, nevertheless, remain intact, in the sense that never are ideas more vivid than in this moment of transition between waking and sleeping. According to Mr. Baillarger, it is at this intellectual period that hallucinations most frequently appear. If I might cite my own case, I should say that, following the advice of M. Brierre de Boismont, I have practised seeing ideas as real forms, so that, in order to sleep, I endeavor to have pictures of objects ; as soon as I begin to have before my vision an object which, by the sharpness of its outlines, seems real, I am certain that it is the commencement of sleep, for in the waking state I can have nothing resembling it. Frequently this object is entirely unexpected and is followed by another equally surprising ; the images thus come and go, effacing one another without my will being able to modify them; in a word, it is a sort of kaleidoscope in which the *ego* is a simple spectator ; I endeavor in vain to fix the memory of them ; there is no end to this moving spectacle ; there is no last image. The memory becomes more and more confused and finally sleep comes without the possibility of determining the moment ; it results from this that there is a gap in our waking, that is to say, a period of time during which our intellectual action remains unknown to us.

For alcohol and for chloroform the phenomena are exactly similar. At the same time with the attention, judgment, will and memory depart, so that we assist at the strange spectacle of an individual living and thinking, but with whom the life and the thought will leave no memory ; if we tell him all that he has done it will all be news to him. There will have been a gap in the remembrance of his intellectual operations, but not in their sequence ; it is the memory and not the conception of ideas that the poison will have disturbed.

Therefore we consider that there is reason to make of the faculty of memory two distinct faculties which are not comparable.

For example, here is an individual drunk, who still is able to walk and to find his way. He remembers the streets which lead to his home, he knows his house, his floor, his room, and yet the next day he will recall nothing that has passed; between the moment when he took the glass in his hand at the banqueting table and that of his waking in his chamber

is a void that no effort of his can fill; nevertheless, his memory sufficed to enable him to find his way, he has recalled the details necessary for him to return to his home, but he has not been able to fix the sensations and new ideas which have passed through his mind during the period of his drunkenness. There is therefore reason for making a distinction between the memory which retains and the memory which has retained.

The first is only possible if the intellectual faculties, among others the will and the attention, are intact; to retain a fact it is necessary to arrest the intelligence there, and to have the power to do it; now it is this power that is wanting in ordinary sleep, in the sleep of chloroform and in that of drunkenness. I should call this part of the memory *active* in opposition to that other part which is *passive* and unconscious memory.

The latter does not disappear, neither in dreaming nor in intoxication; it makes an integral portion of ourselves, and we cannot think without it. Each idea, each image is a memory modified by succeeding memories; deprived of this total of our memories, intelligence would no longer exist. Just as in nature no force is lost, and as the seas are still disturbed by the keel of Pompey's ship, so all impressions have left their traces upon the human intelligence, in such a sort that the conception of ideas is the conscious or unconscious result of all the memories that have been accumulated and elaborated. Then, when the poisons of the intellect destroy the memory, they are able only to affect the active, reflective, conscious memory; they do not carry their action on to the memory of past facts. These are ineffaceable, and a much more profound lesion of the nervous centers is necessary to cause them to disappear.

I do not desire to insist too long upon this distinction, but I think it should be admitted in order to the comprehension of the very complex disturbances of the intelligence consequent upon intoxication by chloroform. As soon as the chloroform, absorbed by the mucous membrane, has passed into the blood, the active memory which requires attention and will has disappeared, nevertheless the intelligence is not yet dead. Ideas are still conceived, old memories persist, sometimes even the memory of past facts is superexcited. We speak a language which we have long thought had been forgotten, we recall old stories which seemed to have been long buried in oblivion, but which had slumbered unknown in some corner of the intellect, as a treasure hidden in a cave has sometimes remained long years without its existence being revealed. This fact of the superexcitation of the memory is the more interesting because in several forms of mental alienation it appears with the same

characteristics, coincident also with the absolute loss of the active memory.

Although insensibility comes rather promptly with chloroform, it does not generally appear till after the loss of the memory, and this difference in the resistance to the poison produces some curious effects. Thus, if the operation is begun before insensibility is complete, the patient will utter cries, howls, or complaints; he will shrink as if he suffered, and will say that the proper time for the operation has not come. He will often judge erroneously as to the sensation he feels, just as an insane person, or a person asleep. To see him so resisting, so agitated, and so testifying to suffering, we should be inclined to believe that the chloroform has had no effect upon the sensibility, yet upon waking he is found to have no recollection of anything that has passed.

Is that true suffering that leaves no trace in the intelligence? The answer to this question is more difficult than would be supposed. Let us suppose, in fact, an acute pain, penetrating, but of short duration, one minute, for instance; certainly, during that minute the individual will have really suffered; but, if all memory of this pain has immediately disappeared, the individual, recalling nothing, will no longer complain; he will deny that he has suffered, and will willingly offer himself for a new operation, for he will imagine he has had no pain; we may therefore say that he has had all the benefit of Chloroformic Anæsthesia. In fine, in the normal state, pain is far more persistent; this same acute and penetrating pain happening to a conscious individual, even if it last less than a minute, will leave an unpleasant memory; the intelligence will be disturbed by it, so that the remembrance of the suffering is, so to speak, the suffering itself. If suppressing the prolonged recollection of a pain is equivalent to suppressing the pain itself, a pain without a memory is no real pain, for that is wanting which is the precise characteristic of every painful impression—this prolonged reverberation which disturbs the mind and the recollection, which, whenever it occurs, is the image, weakened, but still strong, of the primitive pain. Take, for example, two persons who have had a tooth extracted, one has not been willing to take chloroform, the other has taken it to the point of losing his memory, but not his sensibility. Under these conditions, at the moment of the operation, both have cried out and seemed to suffer, but after half a minute their conditions were no longer the same. The first still suffers either from the general disturbance which the violence of the pain has caused, or from the remembrance of the pain, which at each instant

makes him again in his imagination begin the painful operation he has just undergone. On the contrary, the second no longer complains ; he says he has felt no pain ; the painful excitation has left no trace; everything is with him as if he had felt no suffering.

When a patient is made to breathe the vapors of chloroform, regard must be had to his temperament and character. If he is courageous and resolute, everything will go on smoothly, and no difficulty will be experienced in making him insensible ; but if, on the other hand, the prospect of the operation causes insurmountable terror, it will be necessary to double the attention and the vigilance, for under these conditions syncope is very common. Moreover, he will long resist the chloroform, and he will need to breathe much larger amounts than if he abandoned himself to it with confidence, without feeling such senseless fear. It is true that the chloroform always exerts its full power, but the cerebral excitation which some patients undergo, enables them to resist its toxic action ; it seems as though the will were exaggerated and held itself, so to speak, as though to resist energetically the fatal and necessarily victorious action of the poison of the nervous centers. We have seen that there is an analogous action of alcohol. He who wills not to get intoxicated can imbibe considerable quantities of alcohol without becoming drunk. Finally the will will be overcome, and he will fall down, but he will not have undergone the joyous expansion and the delirious excitation of him who has given himself up to it. Also for chloroform as for alcohol, the temperament and character have great influence upon the form of the delirium. He who accepts the chloroform with a smile will have a joyous and pleasant intoxication, whilst he who takes it with terror will have a dream accompanied with cries, with groanings and with terrors.

Thus, the farther we advance in this study, the more we find that there is an antagonism between the different intellectual faculties—of the voluntary faculties on the one hand, and of the involuntary on the other. The latter are the last to yield. The conception of ideas, although their government has been changed or destroyed, follows the usual laws ; the association of ideas always exists ; the chain that binds the last of our conceptions to the first, without a break, is not broken by the poison ; external sensations still come to us, and each one of them awakes a long series of conceptions. As the sense of hearing is the last to disappear, after the patient can no longer either see or feel, he hears what is said around him, and the conversation of the bystanders awakes in his intelligence ideas of all kinds, which follow in regular succession.

In ordinary sleep we meet with something similar, rarely in adults, but with sufficient frequency among the very young. There is, in fact, in children almost always a certain degree of natural somnambulism : without waking the child talks aloud ; sometimes he laughs, he converses, but more frequently he is terrified and weeps. The mother who watches by his bed can, by pleasant words and sweet caresses change the course of these ideas and calm this agitation and terror. The child does not wake, but his terror is calmed, he becomes quiet, and keeps on his refreshing sleep. On waking all memory of it has disappeared.

In mental alienation it has been sought to employ this method to change the course of the delirium of the melancholic or the hypochondriac. I do not believe, however, that *suggestion* has given any good therapeutic results When a patient is seen plunged in a sad revery, words are dropped in his ear, in passing, of gay and joyous ideas, in the hope that these pleasant thoughts will originate a series of similar ones, and end by triumphing over the sorrows and terrors of melancholic delirium.

But all these external phenomena which bear witness, if not to the integrity of the intelligence, to its preservation, are not slow to disappear. To shouts, to noisy songs, succeed confused and unintelligible words. The muscles, strongly contracted in consequence of the violence of the delirium, become gradually relaxed, and end by falling inert. To the period of excitement succeeds that called the period of resolution, during which the sleep is profound. Whatever may be the violence of external excitations, whatever the gravity of the operation performed, nothing can rouse the patient out of the comatose state in which he is plunged. His respiration is regular, his pulse is slow and full, his pupils immobile, and his features, as it were paralyzed, have no longer that convulsive grimace which is the last vestige of sensibility. The intelligence is annihilated ; it seems as though it had left the body, and it is possible to make only a moral distinction between the coma produced by chloroform and that caused by drunkenness. But what a difference in truth ! The first is meant to prevent the suffering of a human creature, the latter is the last term of degradation and vileness ; but in both cases every appearance of intelligent life has disappeared ; a momentary death has smitten the faculties of the intellect, during which that marvellous connection of ideas, of sensations and perceptions which constitutes the thoughts of man seems violently interrupted. Perhaps in the interior of the nervous tissues, cerebral action is still going on un-

consciously and in silence ; but we cannot know the fact ; nothing, moreover, authorizes us to admit that intelligence persists when all memory has disappeared, and no muscular movement betrays the inner work that is going on quietly in the intellectual nervous centers.

Nevertheless all the parts of the cerebro-spinal nervous system are not paralysed ; in fact, respiration and the movements of the heart take place regularly, indicating the integrity of the Rachidian bulb, whilst the other portions of the encephalon, or of the spinal cord can no longer perform their function ; this persistence of the innervation of the bulb is the condition which permits the surgeon to give chloroform without too great danger. It is nevertheless necessary that the attention should be unceasingly awake to the state of the pulse and the movements of respiration, for, in too strong a dose, chloroform ends by extinguishing also the functions of the bulbar nervous system which presides over the movements of the organic life.

However this may be, deaths by chloroform are becoming more and more rare, and these are rather sudden deaths, accidental, than deaths occasioned by the direct action of chloroform. As for the spinal cord which holds under its influence the general movements of all the muscles of the body, it submits to the influence of the poison later than the brain, but sooner than the bulb, so that the three regions of the nervous system that preside over three different functions seem to undergo separately and successively the action of the chloroform. In recent experiments, M. Claude Bernard has demonstrated that the brain becomes paralyzed before the spinal cord in such a way that sensibility is extinct whilst motility is as yet intact ; he has shown also that the brain exercises over the spinal cord a sort of paralysing action. Depriving the cord of chloroform and limiting its action to the brain we obtain anæsthesia ; but if the contrary is done, that is to say, if we limit the action of the chloroform to the spinal cord, preventing its action on the encephalon, anæsthesia will be impossible before the total death of the nerve cells. Thus is authorized the distinction which we have made between the various poisons of the nervous system ; some act on the motility, others on the organic functions, others finally on the sensibility and the intelligence, and chloroform is of this number.

Several volatile and toxic substances act in the same manner as chloroform, and may, at need, replace it ; but chloroform may be considered the type of anæsthetics. Ether, amylene, the chlorinated com poundsof methylene, and even of ethylene have been successively employed, but with-

out striking success, except in the case of ether, which still has its partisans, especially in the hospitals of Lyons.—(*Note,* and in New England.)

Certain gases have analogous properties, in particular the protoxide of nitrogen or nitrous oxide. Humphrey Davy who discovered this gas at the beginning of the century, at the same time noticed that it caused a joyous intoxication, and named it *laughing gas.* It has been since ascertained that this no more than other bodies has the property of producing a joyous intoxication, and that the form of the delirium consecutive upon the inhalations of nitrous oxide depend upon the individual and his temperament. No use is made, except experimentally, of nitrous oxide in the grand operations, and it is employed mainly in dental operations to obtain an anæsthesia which comes rapidly and as rapidly disappears.

Quite recently a new body, somewhat resembling chloroform in its chemical constitution and in some physiologic properties, has been introduced into medicine ; I refer to chloral. Efforts have been made to use chloral for the same purposes as chloroform, that is to say for surgical anæsthesia, but only incomplete and unsatisfactory results have been obtained from it. Enormous doses of chloral are necessary to extinguish all traces of sensibility. Yet chloral is not to be despised ; it calms the spontaneous pains and gives tranquil and pleasant sleep ; in certain respects its action is analogous to that of morphine rather than to that of chloroform. Nevertheless it is probable that chloral, when introduced into the blood, is decomposed, according to a chemical equation discovered by M. Personne, into chloroform and formiate of soda ; but, indeed, all the poisons of the sensibility act in a similar manner, and it is easier to see their analogies than their differences.

A REGULAR MEETING OF THE FIRST DISTRICT DENTAL SOCIETY WAS HELD AT THE OFFICE OF DR. PARKER, ON TUESDAY, EVENING, MARCH 5, 1878, DR. WILLIAM H. ALLEN IN THE CHAIR.

Paper by Dr. Boedecker.

Prof. Heitzman : Dr Boedecker was, I may say, the first dentist who entered my laboratory, and enthusiastic as he was at that time, he brought over several other gentlemen, and among the very best names I have to mention Drs. Atkinson and Abbott. These gentlemen again

brought others, especially young dentists, who took an interest in this study, and now I see the work which I began three years ago, growing and flourishing under my very eyes. Quite a number of classes have been formed mainly by dentists. The main aim was to see how the body is constructed, and particularly the teeth, and more especially when the teeth are sick, which part is getting sick. It is perfectly in vain, in my opinion, to study teeth before a general knowledge of the other tissues of the body is obtained. Teeth histologically considered are perhaps mean things. Still if we compare the things that we see in the teeth with what we see in the other tissues, we come to the conclusion that they are not so mean. On the contrary, they are so extremely complicated, that the more I entered into the study the more I was interested in it. This question especially depends upon a knowledge of the bone itself. As mentioned by Dr. Boedecker, it was the fashion for forty years to examine dry bone, and so it was with the teeth. We have learned a great many things of dry specimens, but the moment we wish to enter into the question, where is the seat of life, dry specimens are of no use at all. It is a matter of course from the moment that bone or teeth dry, the living is relatively a soft mass, and if we grind bone after we have split it into small pieces with a saw, we see the frame work of the former living tissue, but we do not see anything of the living matter. It is strange that great thinkers who have studied the bone did not think about the seat of life. Is it not plain that bone is living just so long as it is in the body, as a tooth is alive just so long as the pulp is invested with life. Where now is life seated? In which part I ask? Is it in the glue making substance that we see under the microscope in dry teeth, or rather these canaliculi that we see in dry specimens containing dirt, air, &c. Where is life, I ask? Dr. Boedecker said we know that from the moment a piece of bone is dead, it is necrotic, and all possible efforts will be made by the body to eliminate the bone out of the body. About ten years ago when engaged in the study of tooth bone, I was struck with a remark of Prof. B———l, who was an excellent observer. He said it is a cunning thing indeed, necrotic bone looks like healthy bone under the microscope; and said, what kind of science is that where so strange a difference can not be demonstrated by the microscope. What was the reason? Dry bone had been used. And still since I took up the bone, which was one of my pet objects—I always urged, don't examine dry bone, and I am sorry to say, thus far, with very little success. Just recently I had a letter from Vienna, from Prof. Wedl, in

which he writes that one of the gentlemen who is working in his laboratory makes beautiful specimens of dry bone. Perhaps I would like to have a few. Two years ago, a gentleman came from Vienna, an assistant of Prof. Breicke, and one of the first questions which I put to him was, do you still grind dry bone? He says yes. It is good practice for beginners. I did not see where the practice was altogether. Romvier, the very best histologist in France, in his recent book, still recommends the old fashioned way of grinding bone, and Rokitausky of Prague, Austria, in his work the first of the year 1877, on the title page, recommends the same thing. Shall we give up because they do not acknowledge the truth right away. I say let us go on ; let us work for it. As dentistry is the most superior science in the world in the technical part, if we go on I think we will make it ahead in scientific regards also, and that is our purpose. I have briefly to say a very few words about Dr. Boedecker's discourse. When I saw in 1872 the bone corpuscles in an inflamed condition I was glad to find that network. I showed them to Prof. Stricker in Vienna, and he of course acknowledged that the canaliculi contained protoplasm. In the next year I came further on in my studies. I found the protoplasm can be differential into a network and a fluid part. When I saw the network of the living matter move about in full motion, and when I saw it growing, especially inflamed, I was certain that this network and the uniting thread represented the living matter, while that part which is contained in the meshes of the network cannot be alive, and is doubtless fluid, which can be demonstrated merely by the phenomena of diffusion, which makes the whole protoplasm shrink just like lightning into a lump which looks homeogeneous. I did not know anything about the fine network which has been discovered by Dr. Boedecker. I knew that every tissue contained that fine network over the basal surface, but I had so little success that I could not give any correct opinion about the size of the meshes which in this drawing are indicated by black. I thought in bone they are until I saw the specimen successfully stained by Dr. Boedecker, and to my astonishment I find the basal substance of bone a fine network with the other material as well. The question was what did the spaces contain. I was satisfied that the canaliculi contained living matter, but the question what the fine network is, is not settled. It is impossible merely with our best powers, say 1200, to see what those fine canaliculi, I may call them, do contain. If there be present living matter, it is doubtless so delicate and minute that even our best powers will not suffice to bring it to our view.

We have to judge about the presence of living matter in these fine canaliculi, I mean the phenomena in inflammation. The very first thing that happens in inflammation is that the glue giving basal substance is deprived of its lime salts. Those things which have been described many years ago, almost twenty years ago, by Rokitansky, that eminent scholar, is really one of the first symptoms, which contains a certain amount of the acid, which I don't know of, which takes off the lime salts. The glue giving basal substance remains. These things can be done in ivory rods just as well. But now the next thing, the basal substance is melted down, and now what do we see. We see that in the place where formerly was one bone corpuscle there appear four, five, six and even seven corpuscles, and the whole territory has itself been broken down. Where do they come from? Because they say the seat of life is present only in the bone cells. That is not the case; we see first a melting out of the lime salts, a breaking down of the glue-giving basal substance, and a reappearance of corpuscles, which we call inflammation. I think we must come to the conviction that not only is the bone corpuscles endued with life, but there must be present living matter in the whole territory, although hidden, and we have come to the conclusion that the living matter is free, and after the melting of the substance the other condition of the bone reappears. In that respect I widely differ from the Prof. and rather agree with Rokitansky, who, thirty years ago, said, there must be something in the substance that is capable of growth and of formation. I asked him what he thought it was. Well, he said, I don't know what it is. I don't think it is the glue, but I say that not only the cells but outside of the basal substance there is something capable of growing and producing new things, and from this I rather judge the doctor is correct in believing that although we can't see the living matter with our present powers, perhaps we shall see it after a while. We can't say the whole bone is provided with living matter, although the protoplasmic power is in the basal substance itself. And now as to the question as to how necrosed bone differs from living bone. A gentleman who saw the work in my laboratory asked me what Dr. Boedecker was doing. I said he was working on necrosis at present. He asked me what was the result. I merely told him in the living bone there was living matter and in the dead bone there is none. He said "I know that." I said do you know it? can you demonstrate it? It is plain enough that in the dead bone there is no living matter at all. The result is just as excellent a result, and it is the result of faithful, good work.

Dr. Atkinson : We ought to be exceedingly humble and joyous this night. If you will just recollect the honest history of these cases of necrosis, and take the opinions of the confessedly leading men who have had the cases before them, for diagnosis and treatment, and then follow it out and see where they stand, and remember that the whole world of medical men has been side by side with these men, who have been proved to be utterly unable to concede the condition at all, and therefore entitled to no opinion at all, but make them capable of abusing those who do. Dr. Heitzman says that living matter and protoplasm are terms that cannot be indifferently used ; and then when we ask what living matter is, he says living matter exists in lumps of substances that are capable of contraction and relaxation ; that in the amoeba the granules were connected by small protoplasmic strings that elongate and contract its movements, and that fluid that he nominates protoplasmic fluid, between this meshwork, is non-living. The point I want to make is to acknowledge to him and to this body that I now accept, as I never did, his discrimination. He says the protoplasmic fluid is non-living. He did not say absolute, in the sense he pronounced the living matter in the strings and granules capable of contraction and expansion.

Dr. Latimer referred to a case operated upon by Dr. Atkinson.

Dr. Atkinson : That is a case quite a number of dentists were called to witness about a week ago. I understand there was quite a difference of opinion upon the question, and I wish to take occasion to emphasize what I said before about our being cautious about pronouncing fancy for opinions, and opinions for beliefs, and beliefs for knowledge. My advice was to enucleate the periositum from the edge of the necrosed bone, where it was still attached, until they had arrived at an unmistakably healthy territory of bone ; to remove that entirely, so as to take away all that portion that had been subject to the inflammatory operation ; and there was an advocacy of the effete and hated expectante constitutional alternative treatment I would plead earnestly with all those who are mere followers of that doctrine, to be converted to the truth, and to understand distinctly what they are about before they attempt to let the necrotic part have its own demonic will and destroy the territory as far as to the nerves belonging to that special locality, and in every case to go into healthy territory, and to make simply an incised wound in any place of the body where it can be got at.

Dr. Bogue : I would like to ask Prof. Heitzman whether there was a chance at the symphoses of the lower jaw for necrotic process to stop of its own accord ?

Prof. Heitzman : I have seen in Vienna a great many cases of necrosis, especially of the upper and lower jaw, occasioned by the poisoning of phosphorous. In manufacturing places, where persons are employed making matches, this disease is a very common one ; I have seen the disease run over the middle ; I don't think that has any effect to stop the disease at all. As a rule, it has shown some determination to stop there, but it runs to the opposite side very often. That is what I have seen.

Dr. Abbott : My friend Atkinson intended to come for me a little, in relation to this case we saw at his office. I have had a little experience with the treatment of necrosis—very little, it is true ; I have had a number of cases in which I have attempted this very operation he speaks of—that of cutting away—and in most cases I have not succeeded to my satisfaction, nor as well, as I have to wait and treat further on, and only to stimulate the system generally, and let it dispose itself of the sequestrum. That is the old treatment, that the sequestrum should never be touched until it is loose. Of course, the doctor is in the habit of indulging in new departures ; and, perhaps, in so doing, I don't say he is wrong, because he probably has had more cases of that kind than I have ; but, in the case spoken of to-night, and cited by Dr. Boedecker, there was an illustration of the statement I made to Dr. Reynolds, that I always feared that the necrosis would proceed still further than I cut, that there would be dead bone to come away after cutting all that appeared to be dead bone. I have no doubt I have made many mistakes. At the same time I have never yet failed in the treatment of a case of necrosis. It seems to me that when the lower pieces have come away there is no trouble in healing it. To cut in with a bur, with me, has not been as successful as the other way. Why it is, I am unable to say, unless I have not gone far enough. That may be true, and I hope it is ; for the next time I get a chance I shall cut it. If I succeed, as the doctor claims any man will, I will certainly give him credit, as I do in everything. In the use of his aromatic sulphuric acid, I can't see the use of it in many instances in which he uses it : I can't see the use of it in such a case as Dr. Boedecker has cited. If the system is built up as well as it can be, I can't see how it is possible for the bone to get loose any quicker by any application that shall dissolve the dead bone—for it is claimed it does not affect the soft parts. I will cut down the granules that come

in contact with it, and keep the case discharging for a longer time than it otherwise would do. I treat these cases with a solution of carbolic acid and potash. In that way I have succeeded ; and I simply said to Dr. Reynolds I should treat this case so and so ; I should give the patient iodide of potassium five times a day, and let the case alone. By the way, in regard to the treatment of the little child I spoke of once or twice, the child has succeeded in getting entirely well. As far as the abscess is concerned upon the face, it has grown nicely, and looks very fleshy and very well indeed ; but it can't give up the iodide of iron—it is given three to five drops right along. I have been giving the phosphate of lime. It has done well under the treatment. I want you to understand it is a difference of opinion in regard to the treatment of this case. I don't wish to take issue with Dr. Atkinson at all, nor with any gentleman, I simply say what my preference is, and I do succeed with this treatment. Dr. Atkinson undoubtedly succeeds with his treatment, and the only way I can account for the failures, is that I have not cut enough away. He has perhaps gone further, and perhaps treated better.

Dr. Bogue :—Dr. Abbott has just remarked that there may be difference of opinion in reference to the removal of necrosed bone if the attachment still exists. I don't know that I am at all capable of judging upon that point, but it seems to me there ought not to be a difference of opinion, and there ought to be some definite knowledge, and I would respectfully urge Prof. Heitzman to tell us whether in bones that are necrotic, be it more or less, and that are accepted or can be made so by any operation, whether this bone should or should not be removed.

Prof. Heitzman : I have seen in Vienna, as mentioned before, a number of necrosed cases, both in the upper and lower jaw, due to phosphorous poisoning. The Dr. said he would rather have a law made about these things but it seems to be impossible to do such a thing. The first man who described the necrosis was Lawrence, in Vienna, who examined the cases first, and found it was the result of phosphorous poisoning, and this man went so far as to deny the usefulness of any operation at all, and advocated the leaving of the exfoliation of the necrosed bone to nature. Not to touch it all. In this way he suggested that the whole lower jaw would be exfoliated, and if surrounded by good bone, restoration to the former shape took place. Others, of course, are of the contrary opinion. They like to eliminate the necrotic bone as soon as possible. My own impression is, that at the beginning of necrosis, that is from the moment that a part of the bone is necrotic, we never can tell the boundary. I

don't think it is useful to operate very soon at all, because, if we do so, then we have no certainty about the boundary. If there is no danger about the life, and that is really so seldom, I think it is better practice to wait until the sequestrum is getting loose. Even in this case the sequestrum was not loose, as mentioned in his, Dr. Boedecker's paper, and part of the bone was endued with life. That seems to be often the case. If they cut into such a part who will say that the necrosis will not advance further on. I have seen operations take place in necrosis, the inflammation went further on and attacked even the base of the skull, and then I don't think it is justifiable to operate. My impression and my personal conviction is not to meddle too soon ; rather allow the solid formation of new bone and wait until the sequestrum itself loosens. But when you are sure it is loose, don't hesitate to extract it at any rate, even by making a new hole. It is, I think, the best way. However, you see how widely opinions differ in this respect.

Dr. Bogue : Prof. Heitzman had received the cases that have been before him in the Vienna Hospitals, and speaks of them on both occasions as phosphorous necrosis. The cases that come under our treatment are not cases of this character, and I think that distinction it would be well for us to bear in mind. At the same time I wish to express my own individual thanks for the Professor's kindness.

Dr. Latimer : I think we ought to make another distinction where necrosis is in the superior maxilliary; it rarely becomes very poisonous. Gravity will bring it away pretty readily ; at least we can facilitate it so that it will not become very poisonous, and we can limit the extent of the necrosis by keeping the passage open and allowing the poison to escape. Of phosphorous necrosis, I have had some few cases. When trying to obtain some safe matches, I found there were some four or five match factories on the West side, near the North River, from 44th street upwards to 52d street, and the second case I had of necrosis from phosphorous was that of a young girl 16 or 17 years of age from one of these. I went to the proprietor and asked him about it, but he would not allow me to say anything about the matter before the employees. He took me into his private office and talked about it. The case I had was in the inferior auxilliary, and was a very persistent case. That was before the dental engine was used, and the only way of removing the dead bone in the necrosed portion was by cutting with a sharp scraper. I used this for removing all the necrosed part that I could, but three or four times I had to renew the operation, and being in the lower jaw, I

found it difficult to keep the parts healthy enough so that the pus remaining would not poison the adjoining portion. This aggravated the case very much. This case of Dr. Reynolds being in the superior maxilliary, where the poison would escape through gravity, is materially simplified. The disinfectants are needed much more frequently in the inferior maxilliary than in the superior. I used chlorate of soda that time. There was another preparation known as Darby's Prophylactic Fluid, which I used with success. When I practiced South I used that in abcessed teeth. It is a good disinfectant, and acts in harmony with nature.

DENTISTRY IN FRANCE.

By the kindness of Dr. F. Abbott, we are permitted to print the following letter:

BORDEAUX, April 9th, 1878.

DEAR DR ABBOTT:

It is now upwards of four months since, through your kindness, I was enabled to expatriate myself from so good a country as America. I have now become quite settled in my new home, and begin to familiarize myself with the manners, customs and language of France.

The climate here is healthy, although rather damp in winter. Of the moral atmosphere, the less said the better; however, I have passed the period of life when one is most likely to be corrupted by the contaminating influences of a *free* country.

I write you, partly from a sense of gratitude, and partly from a desire expressed by the Drs. Alker, to thank you for having recommended me to the office; they also desire to be especially remembered to Dr. Cuyler. With regard to myself, I do not regret having crossed the ocean.

Of the condition of our profession in this country, you are, of course, not totally ignorant; but one can hardly realize how little is here known of the dental art, without actually visiting the country. Mechanical dentistry is, perhaps, a trifle in advance of the operating branch; but the specimens which one sees in the show-cases of dentists here are not calculated to give one great cause for congratulation upon the condition of our art in Europe.

Suction plates are rarely made, springs, clasps, and the *attraction of gravitation*, are usually depended upon to keep the plates in place Our

slow process of cleaning and filling separate cavities is frequently simplified by filling two together, when the cavities are upon the proximate surface of the tooth. The condition of some of the mouths which are presented to us is simply horrid, a fact that somewhat surprises one, when he knows what care is taken in keeping the privies in the city free from accumulations. Roots must always be left in the mouth, even if artificial teeth are to be inserted, as the extreme nervous condition of the patient *absolutely* precludes extraction. The medical profession are as ignorant as the public, with regard to the progress and principles of dentistry.

One apparently intelligent medical man warned a patient of Dr. A's. against suction plates, stating that the traction which they exerted upon the brain was likely to cause a softening of that organ. Another, kindly offered to supply me with a medicine that would arrest *expulsive periostitis* of the teeth, and firmly reset the loosened organs. Still another physician, who sees the hand of a kind Providence in all the works of nature, remarked to Dr. A. that salivary calculus was a wonderful provision which the Deity had made against the annoyance of losing the teeth at an advanced age ; for, said he, the tartar unites the teeth firmly in such a manner that each supports the other, and thus relieves the force which would otherwise be exerted upon individual teeth in the process of mastication.

Thinking that the process of treating diseases of the antrum and abcess of the teeth, which is peculiar to this country, may be unknown to you, I am going to describe a case which presented itself here, and of which Dr. Alker sends you a cut, with his compliments.

The antrum of the patient was perforated just below the molar bone, and a rubber tube inserted. Another incision was then made in the in the cheek, through which the tube was made to pass, in order to allow the pus to percolate into a handkerchief, which the unfortunate was instructed to carry in his bosom.

I recently saw the cicatrix upon the face of a young lady who had suffered from the abscess of a lower molar. The physician had inserted a tube in a similar manner, through which the pus was to escape.

With kind regards, I remain,

Yours, very truly,

W. F. KELSEY.

"REQUISITE KNOWLEDGE FOR THE PRACTICE OF DENTISTRY."

Read before the first District Dental Soc., S. N. Y., by FRANK M. ODELL, D.D.S., M.D.

One gentleman asks :

"Who can talk upon such a subject? What is there that anyone can say upon such a subject, to set the ball in motion? Ten chances to one, it will resolve itself into some remarks upon the way to prepare amalgam."

Another soliloquized : "The whole thing can be told in two words,—Every thing! Every thing is proper knowledge preparatory to the practice of dentistry, and no kind or amount of instruction and experience comes amiss."

According to my view of the matter, the second querist is not far out in his reckoning; but the vagueness of his mode of expression, only serves clearly to show in what a sea of protoplasm we are floating ; and, in the hope that I may be able to poise the ball aforesaid, and initiate its propulsion in a proper direction, I have collected a few thoughts upon paper.

The subject before us resolves itself into a question (for it is hardly to be supposed that we have assembled to-night to dogmatically *pronounce* what must be regarded as such "requisite knowledge," and to send forth our pronunciamento, with the seal of this Society upon it, in the expectation that all practitioners and Societies will meekly bow their acquiescence) : What is the requisite knowledge, &c. ?

Whilst agreeing with the second opinion, as far as it goes, I am still of the opinion that we may be able to get at a more practical answer to our query ; and, as is usual with me, I will begin in the middle, and take up the second idea, which presents itself first.

Anatomy, at least of the teeth and their surrounding alveolar processes, must, as a prime necessity, be practically familiar to the dentist ; for how else can he decently extract, or excavate a cavity in, a tooth ?

A smattering of Pathology, sufficient to diagnose the various conditions in which suffering humanity comes under our notice ;

A sufficient acquaintance with the Therapeutics of dentistry to be able to exhibit understandingly the most common remedial agents ;

An insight into the most superficial laws of Philosophy and Mechan-

ics, to enable one to perform the various operations in which we are wont to expend our energies ;

Sufficient acquaintance with Chemical and Electrical laws, to enable us to study compatibility, and avoid at least proximity of incompatible agencies or materials employed in the mouth.

All this and more, it will readily be conceded, is requisite knowledge, before we can be fitted as the merest apologies for dental practitioners.

But preparation for practice in the higher walks of our profession, requires that the foundation-stones of the structure be laid broad and deep : that the anatomical knowledge extend to the whole structure of man not only, but embrace comparative anatomy likewise ; and that it be not satisfied with any superficial knowledge, but include that of the vascular and neural systems ; that even here it pause not, but dip deeper and deeper into minute anatomy, until even the powerful aid of the microscope fails (inasmuch as we learn thereby only what *comparative* observation can teach), and the aid of the study of Embryology has to be invoked, in order that we may know how to assist in building up tissue, as well as in tearing it down

Our knowledge of Pathology, if extended to the outer verge of what is known in general medicine, can be productive of only good to our patients, whose general physical condition is often indicated very clearly, and sometimes preceded, by indications and conditions readily seen by the observant dental practitioner.

In a Therapeutical direction, we have by no means plumbed the depths of possibilities. Who can tell what application, not antagonistic to protoplasmic integrity, to make to sensitive dentine, or to the intensely vibrating odontoblasts at the exposed neck of a tooth, where even the touch of the cheek, tongue, or finger-nail, is so excessively painful ?

In the domain of Chemistry and Metallurgy, we are certainly merely babes as yet ! Why is it that carbon, which is assumed to be black, forms, with soda or lime, such a snow-white compound ?

We are expanded reservoirs of naked facts ; and, as yet, can give no solution of a query as to causes.

" Requisite—knowledge—for—the—practice—of—Dentistry." I am almost led to a complete indorsement of the second opinion quoted at the commencement of this article, that it embraces every thing ; for, when we examine it from any point of view, Medical, Mechanical, Social, Aesthetic, we find no field which does not yield a harvest for the dental-student to reap.

And all these departments of knowledge, if faithfully worked up, and fully represented by appropriate ganglionic-bodies within the compass of any one organism, will still fall short of completing the *requisite knowledge* for the practice of dentistry, unless carefully guided by *good judgment*, and that most uncommon thing, *common sense.*

CANCEROUS TUMOR—AN INTERESTING CASE.

By J. Clark Scott, D.D.S.

In the month of July, 1877, Benj. Dietz, a German, aged fifty-six, and residing five miles east of this city (Lancaster, O.), called at my office for the examination of a large and threatening tumor, situated on the external side of the inferior maxillary bone, and on the right side. I found the enlargement very hard, and extending well down below the inferior margin of the bone, under the symphosis and angle, firm and immoveable, but no more morbidly sensitive than healthy parts of the body. He complained, however, of sharp shooting pains over the scalp, down the neck, and along both arms. I at once suspected its cancerous nature, but withheld my suspicion from the patient. The tumor had been pronounced an *osteo sarcoma* by several examiners; and, to satisfy myself on this point (though against my opinion), I passed a bistoury from the inside down between the tumor and the maxilary bone, which was followed by a small discharge of pus and blood. For the few succeeding days he enjoyed almost entire relief from the shooting pains, after which they returned with greater force than before, and failed to be relieved by re-opening the orifice. I did not again see the case for some weeks, during which time various means were used for the discussion of the tumor, but all to no purpose. Fomentations were then applied, with some hope of inducing suppuration, and of thus terminating the case. The result was the rapid enlargement of the tumor, with alarming extension of the surrounding tumefaction, which at length began to impinge the trachea, and the knife was finally decided upon as the only means of relief. On the 13th of September, Drs. Turner Jackson, H. Scott and myself, visited the patient; and after he was well, under the influence of ether, the tumor was removed, Dr. Jackson using the knife. The facial artery was avoided. Two or three small branches were ligated, and altogether the

loss of blood did not exceed one gill. The tumor was oblong, and about the size and shape of a small hog's kidney, seemed firm and semi-cartilaginous. The patient came well out of the anesthesia, and was left in a good condition. Only partial relief from the pains followed the operation; no signs of healing by first intention, except the margins of the upper flaps of integument. Within a short time sloughing set in, clearly revealing the true nature of the case; and, after seven months of loathsome and terrible suffering, the patient died, on the 11th day of April, 1878. Before death came to his relief, both the superior and inferior maxilla, including the molar bone, and all the soft parts of the right side of the face were gone, thus laying open the entire buccal cavity. For more than two weeks deglutition was entirely impossible, and death was hastened rather from inanition.

Something more than twenty years since he had two molars extracted from the right jaw, which was followed by troublesome fungus growths from the alveoli, which were repeatedly removed by his attending physician From that time until the swelling began (a little more than a year since) nothing more of an unpleasant nature occurred Mr. Deitz was in every other respect an entirely sound man, and, as far back as his ancestry can be traced, on both sides, no case of cancer was ever known.

A SINGULAR ACCIDENT—PERFECT RECOVERY.

By A. C. Castle, M. D.

Some five years since Henry Wotherspoon, three years of age, fell forward from his chair, striking his mouth and jaws against the edge of the steel fender placed in front of the fire-place. The effects of the blow were to force the six front upper teeth deep in the superior maxillary bones, similar to nails driven deep into a board. I was called in to attend the injured child. I found the gums much tumified and congested: the teeth were driven within the gums, far out of sight, requiring a probe to reach them. Little bleeding followed. There was nothing to be gained by meddling with the case, I therefore concluded to leave all to nature to accomplish a cure. The gums healed, presenting the appearance of the teeth having been extracted. The teeth gradually reappeared in the same manner as they made their first eruption, severally taking

their normal alignment. I have waited with curiosity to know the result of the accident upon the second dentition. These teeth have replaced the deciduous ones, and are taking their positions in excellent order.

New York, May 6, 1878.

METEOROLOGY IN MEDICINE.

BY J. SCHREIBER, M. D.

Translated from the "Oesterreischische Zeitschrift fur Meteorologie" by W. H. Geddings, M. D., of Aiken, S. C.

The employment of climate in the treatment of disease extends back to the time of the Romans.

The invalid patricians were sent to the heights of Stabiæ, and in the summer, when the air of the Eternal City was rendered pestiferous by the miasmas of the Pontine marshes, the well-to-do-inhabitants sought refuge on the health-giving shores of the Mediterranean. The remains of Cicero's summer retreat are still shown near Pozzuoli, in the neighborhood of Naples, and in Horace we find many places in which he sings the praises of the cool air of lovely Baiæ. The beneficial effects of long sea voyages in pulmonary diseases were also known to the ancient Romans. In those early days there were of course no meteorological observations; works on climatology were wanting, and the prescription of a change of residence could be therefore nothing more than a piece of crude empiricism. Eighteen hundred years have since elapsed without materially changing our views.

Within the last fifty years an endless amount has been written about climatic resorts, their peculiarities and their indications in the treatment of disease; but, unfortunately, few if any of them rest upon a truly scientific basis.

These publications contain, it is true, carefully calculated tables of the range of temperature, of humidity and of atmospheric pressure; much about winds and precipitation, and a great deal is said in praise of equability of temperature, the clearness of the atmosphere, the luxuriant growth of vegetation, the blue skies and the charming beauty of the landscape, to say nothing of the favorable sanitary condition of the

inhabitants. The perusal of these monographs, fail, however, to give us any definite idea of the real "healing property" ("heilende princip") in climatic health resorts. We are expected to content ourselves with the assurance that most of the patients who visit these resorts (and they are almost exclusively cases of pulmonary or constitutional disease) are either cured, or, at all events, improved. Up to within very recent times the expressive phrases, "mild climate" and "southern climate," helped us out of our uncertainty in regard to a question so important for both the physician and his patient.

How very unstable were the claims set forth by various health resorts, may be gathered from the fact that places which had been praised to the skies as perfect Eldorados for invalids were sooner or later abandoned; that every nation had its favorite resort, and that the most distinguished physicians often held the most opposite views in regard to the therapeutic value of the same resort.

This state of affairs was due to the fact that physicians were too little versed in meteorology to be able to correctly estimate the various factors or combination of factors, which constitute a climate—or to criticise the erroneous statements advanced in favor of the individual health resorts. When, in addition to this, we consider the great revolution that has taken place in medicine within the last two decades, and the entire change which our ideas of the etiology of consumption and its treatment have undergone within that period, it is not to be wondered at that our conception of the term "climatic" and of "climatic resorts" should have suffered a corresponding modification. Prior to the last fifteen years the word "climatic" was considered identical with "southern," and the term "climatic resorts," was always associated with the scent of oranges and lemons, coupled with dreams of eternal sunshine, soft breathing zephyrs and balsamic exhalations.

The belief prevailed that consumption did not occur in warm countries, but the study of its geographical distribution soon demonstrated the fact that certain tropical regions in both hemispheres were frequently the very ones decimated by that disease, while the inhabitants of the arctic zones enjoyed comparative immunity. It is at last a settled fact that pulmonary consumption is neither favored by a low temperature, nor prevented or cured by a high one.

Meteorology affords ample proof that pulmonary phthisis and temperature have nothing in common.

Although the scourge of the human race is met with in every latitude,

among the inhabitants of Greenland as well as among the negro races of Africa, there are nevertheless certain territories which enjoy more or less immunity. On comparing the climates of some of these, we will not only fail to find any analogy in their meteorological character, but even discover in this respect the greatest dissimilarity, as an example of which we give the temperature of the following places :

	Lat.	*Coldest month.*	*Warmest month.*	*Annual mean.*
Akureyri, Iceland	65° N.	28.40° F.	56.12° F.	40.10° F.
Orenburg, in temperate zone	51 "	3.93	69.80	35.96
Madras, torrid zone	13 "	77.00	88.16	81.50

The great interest and vast importance of this complicated question might readily tempt me to exceed the limits imposed by the strictly meteorological character of this assembly. Omitting, then, that portion of the subject which appertains more properly to medical science, I shall confine myself to that which is capable of being considered from a meteorological point of view, but take the liberty of premising that I shall use the word "meteorology" in its widest sense, and include the chemistry of the atmosphere.

In order that we may correctly estimate the influence of meteorology in medicine, it must be stated at the outset that the latter has not as yet discovered for the physician what he has so long sought in vain, an ideal climate. The great service of meteorology, and which one should not be underrated, consists really in the correct estimation of facts, the unearthing of errors, and the establishment of unassailable truths. If you will take the trouble to glance over any one of the numerous monographs on resorts in Italy or the Riviera you will find much praise bestowed upon the equability of the climate. Now meteorology teaches us that the diurnal range of temperature increases as we proceed south, and that the difference in temperature of two consecutive days is just as great in Italy as with us (Vienna). Meteorology teaches further, that equability of temperature, that is when the term is applied to a long series of consecutive days is only met with on the other side of the temperate zone, in the region of the trade-winds and calms, and that when this property is desired, and value aatached to it, we must seek health resorts in the western portion of our continent (Europe), as on the coasts of France, Netherlands, and of Norway, or on the western coast of England. It is particularly in this direction that meteorology has done good service, in correcting misconceptions, and demonstrating that, so far as equa-

bility is concerned, southern localities are less "climatic" than those situated farther north. Regarding the subject from such a point of view, we would have to rank the coast of Norway as very "climatic." Considering this question in a strictly scientific spirit, without regard to its practicability and the difficulty of its execution, our physicians would have to turn their backs to the northern hemisphere altogether and direct their attention to the northern portions of New Zealand, where the invalid could remain the whole year, the temperature of the coldest month being 48.2° F., and of the warmest 62.6° F., with the rainfall distributed equally over the whole year, and where in addition to these advantages endemic diseases are unknown.

It is only recently, and since physicians have occupied themselves with the study of the meteorological phenomena so essential in climatic therapeutics, that they have discovered that the term "southern" is not synonymons with "warmth," and that if we are in search of warm localities in winter we may attain our object just as well starting from the interior of our continent, say from the Ural mountains, by a journey westward as southward.

You are aware, gentlemen, that during the past ten years hundreds of invalids have wintered in the elevated valleys of the mountains with just as favorable results as in the so-called southern resorts.

This conclusion was reached by observing that consumption in all latitudes diminishes with altitude, until finally it disappears altogether.

It was supposed that the rarity of consumption in these elevated regions was due to a diminished pressure of the atmosphere, and upon this theory a pompous scientific structure was reared, which, however, after a little while soon fell to pieces. I must here crave your indulgence if, to make my subject more intelligible, I speak a little of things appertaining more strictly to my own profession. The theory just mentioned died out in consequence of a revolution in our views concerning the nature of consumption.

Formerly every variety of pulmonary phthisis was supposed to be the result of a neoplasm (tubercle) developed in the lung tissue, which underwent manifold metamorphoses. It was observed, however, that many of these cases were not associated with any such neoplasm, but were dependent upon disordered nutrition, imperfect hæmatosis, and pathological processes, leading in the first place to inanition of the lungs, and then to wasting of the whole organism. The physiological effect of diminished atmospheric pressure to increase the heart's action was

utilized for therapeutic purposes, and this diminution of pressure was regarded as the cause of the immunity from consumption observed in the mountainous regions of every latitude. More extended observation, however, soon demonstrated the fallacy of this assertion, for it was noticed that the altitude at which this immunity commenced varied with latitude, being higher the nearer we approach the equator, which could not be the case if the above theory were correct, the laws of diminished pressure being everywhere the same.

An inquiry instituted in Saxony, at the expense of that government, proved that elevation had nothing to do with immunity, very high localities in the Erz and Riesengeberge exhibiting a large percentage of phthisis as soon as the inhabitants turned their attention to the industrial arts, such as mining and the manufacture of china ; while, on the other hand, the percentage in the low lands was diminished when the people were engaged in agriculture and cattle raising. Thus we see that science has failed to confirm the theory ; the praetice, however, of sending invalids to winter in mountain regions proved nevertheless a success. The ice was broken, and the old custom of seeking "mild," that is, "warm" climates, was thrown overboard. The fact thus established gave rise to renewed researches, which, while they confirmed the good results accruing to consumptives from a residence in the mountains, found that they were due to other causes than altitude.

Fifteen years ago an English physician, MacCormac, published a book, in which he claimed that pulmonary consumption was an artificial product developed by inspiring air which had been previously expired, "rebreathed," as he expressed it. This "rebreathed air," he asserted, contained organic substances which gave rise to disease in the lungs. He went so far as to say that there would be no pulmonary consumption if every one would sleep with open doors and windows, and his first prescription was to sleep with the latter half if not wholly opened. It was a long time before his words were taken to heart ; and if all physicians have not the courage of MacCormac to make their phthisical patients sleep in winter with open windows, they at least order the apartments of such invalids to be aired several times a day in the coldest weather, and allow them to walk in the open air, even when the temperature is below the freezing point.

It has been established beyond all doubt that these organic substances, be they the gaseous products of putrefactive processess in the animal or vegetable kingdom, or vegetable germs, or microscopical animalcules

floating in the atmosphere, do reach the lungs with the current of air inspired, and are there capable of doing great mischief. The great hygienic value of ventilation, the object of which is not only to supply fresh air, but also to carry off that which has been contaminated with miasmas, has been demonstrated by a recent and very instructive example. During the late typhus epidemic in Vienna the physicians, nurses and others in the various Vienna hospitals, were attacked with the disease, but in the Rothschild Hospital in the suburb Wahring, there was not a single case of contagion, although numerous cases of the disease were treated there. This latter is the only hospital in Vienna which is provided with a ventilator in the cellar worked with steam, by means of which the air in every room is emptied and renewed. Now Pasteur has proven that the organic substances are much more numerous near the earth's surface than in the higher strata of the atmosphere, and that they continue to diminish the higher we ascend, disappearing entirely when we reach a certain height in the mountains. We have therefore in the presence of or absence of these organic substances a very important point of distinction between the air of the plains and that of the mountains. That these substances are much more abundant in crowded cities than in small towns and villages is self-evident. Considered from a climato-therapeutic point of view, ozone and rain are intimately associated with this question. The property possessed by ozone of purifying the atmosphere depends upon its oxydizing power. While oxygen requires a considerable degree of heat before it will combine with other substances, ozone does so at ordinary temperatures. Ozone destroys the products of decomposition by chemically combining with them and converting them into other bodies. The absence of ozone, however, does not justify the conclusion that the air is necessarily bad, as it may happen that all ozone may have been expended in the oxydizing of the organic substances in it. On the other hand, the presence of ozone is proof positive that such an atmosphere contains no organic substances.

The air of the ocean and high mountains is richer in ozone than that of the plain, because the former contains little or no organic matter. Here, as in many other things, every-day experience has forestalled science. It has been the custom for quite a long time to recommend the pine woods as a place of residence for pulmonary invalids, but the "why" of the procedure has only recently been discovered. The turpentine exhaled from the pine forests possesses to a greater degree than

all other bodies the property of converting the oxygen of the air into ozone, and as this latter destroys organic matter, the air of such forests must be very pure, and consequently conducive to respiration.

Whether the direct inhalation of ozone is of any advantage must still be considered an open question. As the red blood corpuscles themselves rapidly convert the oxygen into ozone, it would appear that the latter is not required in the respiratory process ; and Alexander Schmidt, of Dorpat, is of the opinion that all the processes of oxydation within the organism are accomplished not by oxygen, but by ozone, oxygen outside of the body being scarcely ably at the temperature of animal heat (98.50° F.) to bring about the oxydation of highly organized bodies.

As air is mechanically cleansed by rain and snow, so it is chemically purified by ozone. Rain, as it were, washes out the atmosphere, and carries with it to the ground not only its solid particles, but also its carbonic acid and ammonia ; hence, while agriculture regards it as a capital fertilizer, medicine attaches to it a greater importance as a hygienic agent, and this, too. in direct opposition to those writers who are continually boasting of its long-continued absence at the different resorts they may chance to represent.

Medical climatology, on the contrary, claims that rain is a necessary factor, and refuses to recognize the worth of those climatic resorts where for weeks and months at a time it never rains. It must, of course, be granted that long-continued rains are disagreeable in many respects, but then this unpleasantness may be salutary, in the same way that the virtues of certain medicines are in no way impaired by their disagreeable, or even disgusting taste or smell. It remains for us now to glance at the composition of our atmosphere, which under healthy normal conditions is, as a rule, as follows : 100 volumes contain oxygen, 20.81 ; nitrogen, 79.15 ; carbonic acid, 0.04. Nitrogen plays no part in the respiration, and may hence be left out of the question. The quality of air is estimated by the amount of oxygen and carbonic acid it contains. The difference between normal air (O. 20.81) and that which extinguishes a candle (O. 18. 27), or in which man ceases to exist (O. 17.20), strikes every one at a glance ; but the question has been raised whether any importance was to be attached to a slight difference, such as that which exists between two samples of air, the one containing O. 20.999, and the other O. 20.980 volumes.

Angus Smith, in his book on "Air and Rain," replies that such dif-

ferences exercise absolutely no influence on respiration so long as there is simply a diminution in the amount of oxygen, which may perhaps have been expended in the formation of ozone, but that the case is otherwise when a putrid gas takes the place of the oxygen absorbed by the products of decomposition. It will be remembered that apparently trifling differences are often of great importance in chemical researches.

If we subtract, for instance, 0.980 from 0.999 we get 0.019 for 100 volumes, or for a million a difference of 190. If now our drinking water is contaminated with poison, or with some decomposing substance, which must be regarded as poison, in this proportion of 190 to 1,000,000 we get in every litre (2.113 pints) 0.19 grammes (2.931 grs.); a quantity amply sufficient to cause disease or even death.

Besides this, it must not be forgotten that the amount of fluid taken as drink is as nothing compared to the enormous quantity of air inspired. An adult takes, on average, about from three to four litres of water a day, but inhales no less than 6,000 to 12,000 litres of air. Then again, I must remind you that the impurities breathed in with the air *remain* in the blood (except in these cases where they are excreted from the circulation), and that this latter is devoid of those disinfecting properties possessed in so high a degree by the secretions of the stomach. The above-mentioned quantity would be for many poisons a truly gigantic dose, but still the proportion inhaled at each inspiration is only the two-thousandth part of a grain, or 0.0000035 grammes. How infinitesimally small is the amount of arsenic diffused through the atmosphere by our green wall-papers, and yet how severe are the cases of arsenic poisoning in persons inhabiting rooms the walls of which are covered with this paper.

I need not call your attention to the cases of lead colic among painters who use white lead, or of the diseases so prevalent among those who are engaged in pursuits necessitating the use of mercury and phosphorus. The malignant fevers of tropical regions, with their thousands of victims, arise as do the malarial fevers of our swamps, from the inhalation of air contaminated with the products of decomposing animal and vegetable matter, these latter being gaseous in their nature.

Yellow fever is caused, as has been demonstrated, by the inhalation of the spores of an alga which grows in the Gulf of Mexico. This fever never occurs at an elevation greater than 2,000 feet above the sea level, at which height the spores probably cease to find a temperature sufficiently high to sustain their vitality. For the same reason, the fever

appears only during the warmer months of the year. You will see, gentlemen, that the term "climatic," which has been hitherto employed to denote a vague, indefinite specific of which no rational account could be given, appears now as something infinitely clear and very simple, being in fact nothing more than pure air, uncontaminated by miasma, with no organic or inorganic substances, and one in which meteoric precipitation (rain) is not unduly deficient. I say "appears," because the proof is still wanting, and the researches of the next ten years may render our present views untenable. No place, however, even when it possesses the above-mentioned quality in the highest degree, should be considered as suited for climatic treatment, unless it has also a number of other qualities, the discussion of which must be reserved for a strictly medical assembly.

I can not close without expressing the wish that the Central Bureau of Meteorology may take into consideration the propriety of extending its field of operations so as to include in the work of some of the stations the observations of the quantity of ozone and of the organic and inorganic impurities present in the atmosphere.—*From Missouri Dental Journal.*

DENTAL LEGISLATION IN OUR STATE.

The following bill was prepared by the Committee of the Dental Society of the State of New York, and accepted by the Hon. Mr. Galvin as a substitute for the Bill introduced by him in the Assembly, February 15th, 1878.

NORMAN W. KINGSLEY, New York,
A. M. HOLMES, Morrisville,
A. P. SOUTHWICK, Buffalo. } *Committee.*

STATE OF NEW YORK, No. 406.

IN ASSEMBLY,

February 15, 1878.

Introduced by Mr. GALVIN—read twice and referred to the committee on general laws—reported favorably from said committee and committed to the committee of the whole.

AN ACT to regulate the practice of dentistry in this State.

The People of the State of New York, represented in Senate and Assembly, do enact as follows :

SECTION 1.—It shall be unlawful for any person to practice dentistry in the State of New York, unless such person shall have received a diploma or certificate of qualification from the faculty of a dental or medical college, or from the State Dental Society, or from the District Dental Society of the district in which they practice ; provided that nothing in this section shall apply to persons engaged in the practice of dentistry in this State before the first day of January, eighteen hundred and eighty, nor to any person who has been engaged continuously in the practice of dentistry since January first, eighteen hundred and sixty.

§ 2.—Any person who shall practice dentistry without having complied with the regulations of this act shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not less than fifty dollars, nor more than two hundred dollars for each offense. All such fines shall be paid into the treasury of the county where such conviction shall take place, for the benefit of the common schools within said county.

§ 3.—All acts or part of acts inconsistent or in any wise conflicting with the provisions of this act are hereby repealed.

I. 387, G. O. 452.

AMERICAN DENTAL ASSOCIATION.

The eighteenth annual session of the American Dental Association will be held at Niagara, Tuesday, August 6, 1878, and continue in session four days.

MARSHALL H. WEBB,
Corresponding Secretary.

NOTES.

Proposed National Dental Association.

The following has been handed us in reference to the proposed National Dental Association :

BALTIMORE, April 15, 1878.

DR. R. FINLEY HUNT,
Chairman American Dental Association Committee :

Dear Sir : I have been informed by Dr. Atkinson that the American Dental Association, at its meeting in Chicago, in August last, referred the subject of the formation of a "National Dental Association or Congress," to a Committee of ten, of which you are Chairman.

A similar Committee has been appointed by the American Dental Convention, and also, as I learn, by the Southern Dental Association, with instructions to confer with your Committee, and with each other.

As Chairman of the former, I have the honor to request that you will, at your earliest convenience, inform me what steps are best in the opinion of yourself and Committee to carry out the object of these appointments.

Very truly yours,
R. B. WINDER.

The Committee from the Southern Dental Association are :

Professor S. P. Cutler, Chairman, Memphis, Tenn.; Drs. J. R. Walker, New Orleans, La.; F. J. S. Gorgas, Baltimore, Md.; H. J. McKillop, St. Louis, Mo.; W. H. Thackston, Farmville, Va.; W. G. Redman, Louisville, Ky.; William Deason, Mobile, Ala.; E. J. Chisholm, Tuscaloosa, Ala.; W. G. McElhany, West Point, Ga.; T. J. Moore, Columbia, S. C.

The Committee of the American Denta Convention are :

Drs. R. B. Winder, Chairman, Baltimore, Md.; A. L. Northrop, New York City; Jno. Allen, New York City; B. F. Coy, Baltimore, Md.; J. Taft, Cincinnati, Ohio; C. E. Kells, New Orleans, La.; R. B. Donaldson, Washington, D. C.; H. B. Noble, Washington, D. C.; C. King, Pittsburg, Penn.; C. F. Faudenburg, Pittsburg, Penn.

New Jersey State Dental Soeiety 1877-78.

NEWARK, April 24, '78.

Editors of Miscellany :

DEAR SIRS—The Eighth Annual Session of the New Jersey State Dental Society will convene at Long Branch, at the United States Hotel, on Wednesday, July 17, and continue in session three days. The Board of examiners will meet one day in advance, the 16th inst , for the examination of candidates, who will be on hand prompt at 10 A. M. Representatives from kindred societies will be cordially welcomed. Dr. Wm. H. Atkinson, of New York, will address the Society. Parties desirous of exhibiting new appliances, dental materials, &c., will be given the opportunity.

CHAS A. MEEKER,
Secretary.

South Carolina State Dental Association.

The Eighth Annual Meeting of the South Carolina State Dental Association, J. R. Thompson, D. D. S., President, will be held in the city of Columbia on Tuesday, June 4, 1878, at half-past 8 o'clock P. M. There will be Essays, Discussions and Clinics ; also a large assortment of Denta

Material and Instruments, including the latest improvements, as per resolution of last meeting. The various railroads are requested to pass delegates at reduced rates. The State Board of Dental Examners will grant licenses to candidates who pass a satisfactory examination.

Executive Committee—Dr. W. L. Reynolds, Dr. T. T. Moore, Dr. D. L. Boozer.

G. F. S. WRIGHT,
Recording Secretary.

California State Dental Association.

SANTA CLARA, May 1, 1878.

The Ninth Annual Session of the California State Dental Association will be held in San Francisco, June 4, and continue four days.

THESIS.—The Use of the Microscope; J. L. L. Asay, M. D. What is to be the future Status of Dentistry; Clark L. Goddard, D. D. S. Professional Etiquette; Wm. Dutch, D. D. S. The Diseases of the Gums and Process, and their Treatment; S. E. Goe, D. D. S. The best Methods and Materials for Treating and Filling Children's Teeth; C. S. Lane. The best methods of Separating Teeth; S E. Knowles, M. D., D. D. S. Prevention and Treatment of Decay on the Proximate Surface of Teeth; Wm. F. Thompson, M. D., D. D. S. All members are respectfully invited to present voluntary Essays on any subject pertaining to our profession which they may select.

Previous sessions have been of great benefit to the profession, and we confidently hope the coming one will equal, if not excel, in interest and usefulness any that have preceded it.

It is expected that more time will be given to clinical operations than has been during former sessions, for by this means it is believed more good will be accomplished than by any other.

The elevation of the profession is the first object we have in view, and it is earnestly desired that each member will feel that he should contribute to the common fund of knowledge, from which we may all freely draw.

That the coming session may be made one of unusual interest, you are respectfully urged to suspend dental operations in your office for a few days, and unite in an endeavor to make the Ninth Annual Session one of pleasure and profit to all.

Very respectfully yours,

WM. B. KINGSBURY,
Pres. California State Dental Association.

Massachusetts Dental Society.

The thirteenth semi-annual meeting of the Massachusetts Dental Society will be held in the parlors of the Bay State House, Worcester, Thursday and Friday, June 6th and 7th, 1878. Session to commence promptly at 11 A. M. on Thursday.

The following gentlemen have promised to read papers, the subjects of which will be announced in another notice :

Dr. T. H. Chandler, Boston ; Dr. G. F. Waters, Boston ; Dr. S. J. McDougall, Boston ; Dr. C. G. Davis, New Bedford ; Dr. C. H. Osgood, Boston.

Any members of the profession volunteering essays will please notify Dr. C. H. Osgood, 147 Tremont street, Boston, at an early day.

Gentlemen desiring to give a clinic, or wishing to exhibit objects of interest to the Society, can notify the Chairman o the Executive Committee.

Those receiving this circular are requested to invite their professional brethren to attend.

Programmes will be issued announcing the subjects of papers, also all business of the meeting.

J. H. BATCHELDER,
Chairman of the Executive Com.,
137 Washington Street, Salem, Mass.

Alumni Association of the Philadelphia Dental College.

Annual meeting held Wednesday, February 27th, at No. 108 North 10th Street. The following officers were elected for 1878 and 1879: President, Dr. M. H. Cryer, Ohio. 1st Vice-President, J. R. C. Ward, Penn. 2d Vice-President, Jese Pro Alves, Brazil. 3d Vice-President, C. S. Mathews, Ohio. Treasurer, W. A. Breen, Penn. Secretary, Daniel Neall, McQuillen, Penn. Executive Committee, Drs. J. T. Esingberry, Alonzo Brice, S. Ashley Faught, of Penn. The graduates of the Philadelphia Dental College are requested to send their full address to Dr. D. N. McQuillen, 108 North 10th Street, Philadelphia, Penn., Secretary Alumni Association of Philadelphia Dental College.

Teeth of the Races.

Dr. E. Lambert, of Brussels, has made a careful study of the teeth in the various races of man, and has arrived at some interesting conclusions. He finds very distinct characteristics in the dentation of the white and black races, especially in the molar teeth, for while in the former race they decrease in size backward, the last or wisdom tooth being the smallest, it is the reverse with the black race, the last being the largest.

Again, in the white race the molars have usually four cusps; in the black race the more usual number is five.

He observes also in the black race a slight diastema not met with in the white, and with the former the inner tubercle of the premolar is less developed than the outer, as with the anthropoid apes.

The dentation of the yellow races is more closely allied to the white than to the black race.

The red or native American race was unexpectedly found to present very nearly the same dentary characteristics as are shown in the black race.

Pulling a Tooth.

The bravest often quail at the prospect of a visit to the dentist, and endure martyrdom from toothache rather than submit to the extraction of the offending tooth. But when one's courage is screwed to the extracting point, it is evidently to the patient's advantage that the operation should be performed by a skillful hand rather than by the unpractised one of the sufferer. A Frenchman residing in the environs of Paris held a contrary opinion, and it is still doubtful whether his error may not cost him his life, owing to the unusual manner in which he played the *role* of dentist. He had long been suffering from toothache, but obstinately refused to have recourse to a dentist, and at length, finding the pain unendurable, took the following uncommon method of extraction: To the tooth he attached firmly a long string; to the string a heavy stone. Thus armed, he proceeded to the topmost story of the house he occupied, opened the window, and hurled the stone into the air. The weight of the stone and the length of the string produced so violent a shock that not only was the tooth pulled out, but with it a portion of the man's jaw. His neck became so painfully twisted that he fainted. Hours ensued ere consciousness returned. When he ultimately recovered his senses, it was only to find himself deprived of the faculty of speech; in short, his condition was such that it was found necessary to remove him to an hospital.

Hearing Through the Teeth.

It is not every man who can hear with his teeth better than with his ears, but there are two or three employees of the water works who can tell whether water is passing through a pipe by resting the teeth on a stop-cock and stopping both ears with the fingers. The operation was performed to-day in front of the Massasoit House, where a pipe was supposed to be obstructed. In this case the workman held one end of a small metal rod in his teeth, allowed the other end to touch the top of the stop cock, covered both ears, and quickly said, "I hear a small quantity of water passing through the pipe." *Springfield (Mass.) Union.*

DENTAL ORDER FOR TEETH.—A correspondent of *Harper's Magazine* sends to "the Drawer" a copy of an order received by a Broom County dentist, which says: "My mouth is three inches acrost, five-eight inches threw the jaw. Sum humoky on the edge. Shaped like a hoss-shew, toe forrard. If you want me to be more pertikler, I shal have to cum thar."

JOHNSTON BROTHERS'

Cone Journal Hand-Piece.

The only Hand-Piece which stands the test of long use without wearing shakey and out of true.

THESE HAVE BEEN IN USE FOR NEARLY TWO YEARS, AND ARE STILL RUNNING TRUE AND IN GOOD CONDITION.

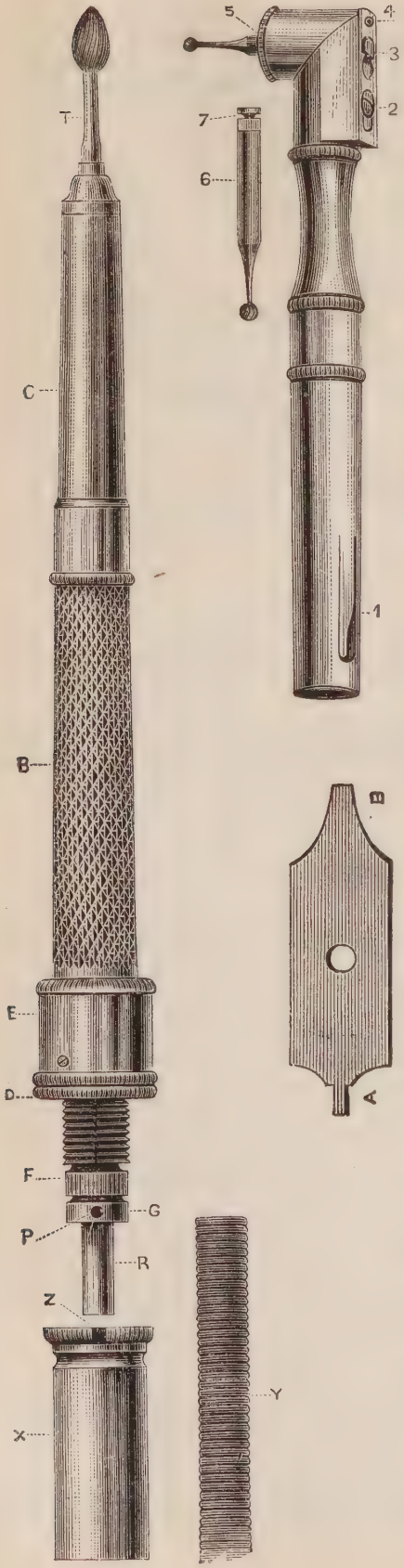
IN THE ESTIMATION OF MANY WHO HAVE THE CONE JOURNAL HAND-PIECE IN USE, IT ADDS A HALF TO THE EFFECTIVENESS, AND HENCE TO THE VALUE OF THEIR ENGINES.

IT IS READILY ATTACHED TO EITHER OF THE ENGINES MADE BY US, OR TO THE S. S. WHITE.

SEE THE FOLLOWING PAGES FOR DESCRIPTION, CUTS, AND TESTIMONIALS.

THE CONE JOURNAL HAND-PIECE,

THE GREATEST IMPROVEMENT IN DENTAL ENGINES SINCE 1872.



No matter how hard the bearings of a Dental Hand-piece may be made, if they are constructed as they have been hitherto, they will soon wear loose and shakey, and allow the bur to wabble.

By making them conical we secure two great advantages.

1st. The Journals are larger, and so present more surface to stand the wear.

2d. The little wear there is can, at any time, be taken up by forcing the cone on the spindle further into its seat, so preventing any shake and at the same time bringing the spindle to a true centre.

In our Cone Journal Hand-piece the cones are large and are *all of hardened steel*, and in addition are very carefully protected, so that it is almost an impossibility for any polishing or grinding material to get to the bearings. In the old styles of Hand-pieces it will be remembered the shank of the bur goes inside the nose-piece, and directly through the principal journal of the Hand-piece into the spindle, and so frequently carries in the polishing material used—be it pumace stone or corrundum. In the Cone Journal Hand-piece the spindle extends out-

side the nose-piece, and the bur goes into a socket in its end, thus making it impossible for the bur to carry any dirt to the journals or bearings. There is no opening through the case of the Hand-piece through which oil can find its way to the hands of the operator or to the lips of the patient. The right angle slips on over the end of the Hand-piece and securely locks itself so that it will neither revolve nor detach itself.

An Improvement only Fonnd in this Hand-Piece.

The right angle burs are securely held in the right angle by a new locking device, which is both simple and effective.

The end of the spindle R. is bored out at the end to receive the end of the cable of the S. S. White engine, while the outside is properly sized to take the regular driving spring of the Morrison engine.

A small screw-driver and directions for taking apart accompany each Hand-piece, though, with a fair usage neither need be touched for months, certainly not until it is necessary to clean the Hand-piece.

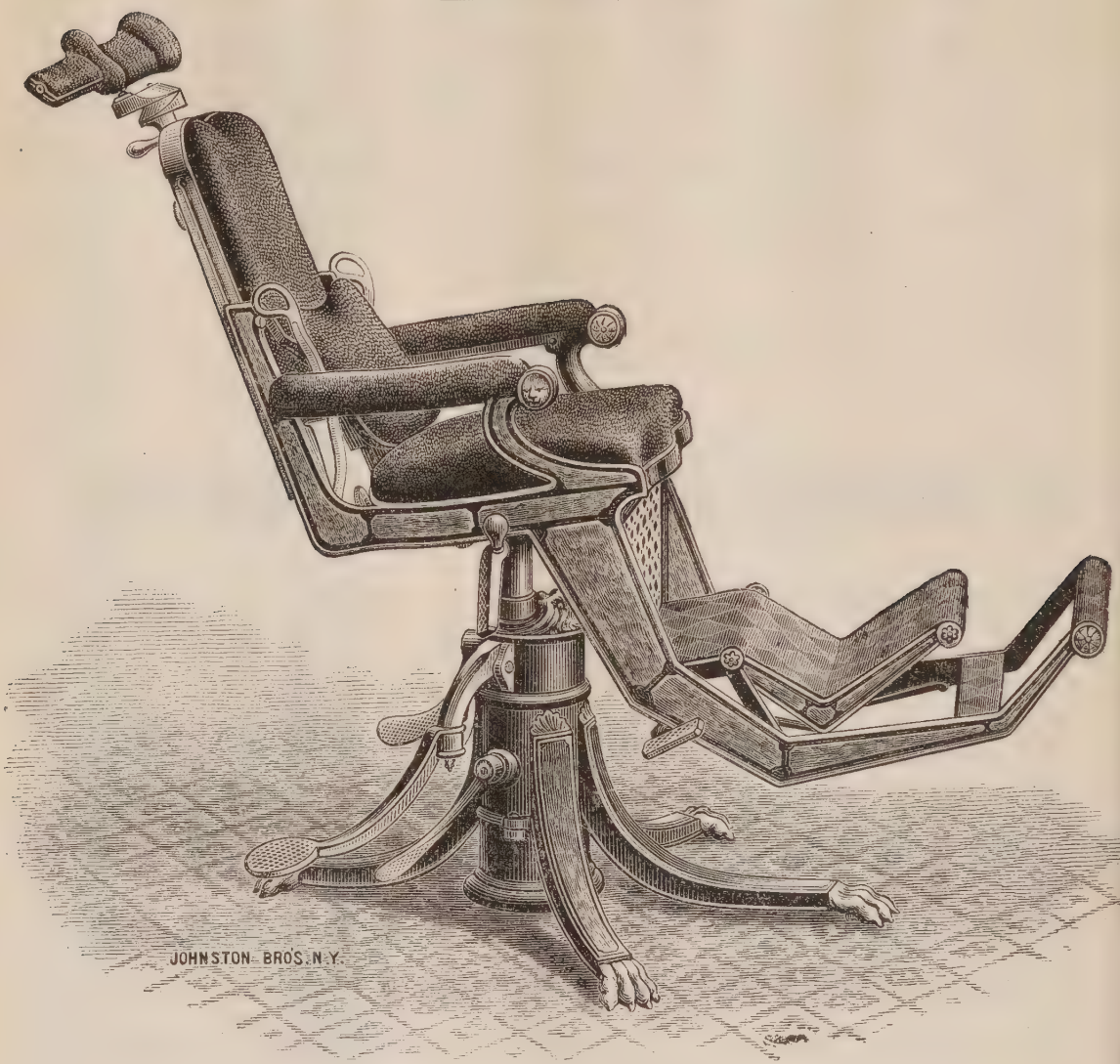
The burs used with other engines or hand-pieces—or the various attachments for the S. S. White hand-piece—are easily and cheaply altered to fit the Cone Journal Hand-piece.

PRICES.

Cone Journal Hand-Piece, with 1 doz. burs, - - -	$10 00
New Right Angles, with bur-lock, - - - - -	5 00

Wilkerson Dental Chair.

PATENTED NOV. 20, 1877.



PRICE, $175.

The cut is a good representation of this unique chair. The acknowledged requirements of a first-class dental chair have been here secured by Dr. M. B. Wilkerson—the inventor—by methods showing great originality. All cranks are dispensed with and levers substituted for them. The chair is raised by pressure of the foot on the long lever, which hides the back foot in the cut. This operation requires very little effort, and occupies but eight seconds, and is only equivalent to stepping up eight steps. To lower the chair one has only, with the toe of his boot, to raise the lever just back of that first named, and the chair sinks rapidly and noiselessly until the lever is dropped, when it instantly stops. Except when in use the long lever folds in under the chair.

A touch of the lever in front of that just named, leaves the chair free to rotate through the whole circle. Directly beneath the seat of the chair, and close to the seat, is shown a lever, which, when pressed forward, permits the rocking movement while the lever is held, but whenever released fastens the chair in position.

Thus the three principal movements, elevation, rocking and rotation, are accomplished. The minor movements, all of great importance, however, are the raising or lowering of the back of the chair; the raising in like manner of the head-rest; the slight rocking of the seat of the chair, so as to prevent the patient from sliding forward; the adjustment of the footstool at various lengths and heights; the spring back support to rest the small of the back. This, at will, is converted into a capital child's seat.

An arm-rest is shown at the right of the head-rest. It can be secured on either side of the head-rest at will.

The whole chair is of the most substantial construction and highly ornamental. It will be upholstered in either green or garnet plush or in leather.

This is *not* an hydraulic chair. It has *no pump*, but is raised simply and solely by a lever actuated by the foot. When raised, the elevation of the central column, which supports the chair, tends to produce a vacuum in the chamber through which it passes, and this chamber is immediately filled by a column of oil, which, opening a valve at the bottom of the chamber and directly following up the central column of the chair, blocks it up whenever the lever ceases to raise it higher. Of course, whenever the same valve is tripped, the oil flows back into its receptacle, and the chair is rapidly and noiselessly lowered. *Not one drop of oil* has ever or can ever find egress from the inner base of the chair to its exterior. So much to silence constant misrepresentations of another dealer.

ADVANTAGES.

1st. It can be raised with the foot of the operator, and by a very slight effort.

2d. It can be raised in half the time of any other dental chair, except the Morrison.

3d. It can be lowered without exertion of force, and as much or as little, or as fast or as slow, as desired, by merely opening a valve.

4th. Its range of movement is superior.

5th. It has a perfect forward and backward movement, so that the patient can be rapidly inclined at any angle by a very slight exertion of force by the hand.

6th. Its arrangement for children is unique and excellent.

7th. Its footstool is readily adapted to the wants of large or small persons.

8th. Its head-rest is completely firm in any position in which it may be placed, has a large range, and is fastened by a single movement of the hand.

9th. The operator can control all its movements without once taking his hand from the mouth of the patient.

10th. It has a perfect rotary movement.

11th. By means of an adjustable foot it will stand firmly on any floor, however uneven.

We have orders for a large number, and are receiving more daily, and entering them in rotation.

JOHNSTON BROS., 1260 Broadway, N. Y.

JOHNSTON BROTHERS & SELBY, 23 N. Charles Street, Baltimore, Md.

Comfort for both Operator and Patient, Rapid Movement, Simplicity of Construction, Great Durability.

The desirable features of a dental chair are almost completely enumerated above. The Morrison Chair answers each of these requirements more completely than any other chair made.

It contributes to the ease of the operator:

1st. By the lightness and rapidity with which the patient is raised or lowered to a convenient position.

2nd. By the form of its back, which is so narrow as to render it unnecessary for the operator to stretch to reach his patient.

3d. By permitting him to drop either arm of the chair entirely out of his way.

4th. By making it possible to operate in either a standing or sitting posture with equal facility.

It affords comfort to the patient:

1st. In the arrangement by which the lower back-pad may be moved forward to support the small of the patient's back.

2nd. The upper back-pad is readily raised or lowered, so as to exactly adapt itself to the wishes of any patient as if the chair had been made for this one person.

3d. By the readiness with which the patient may change the foot-stool from one position to another as suits their notion at the moment, and without disturbing the operator.

If desired this chair can be furnished with either the usual upholstery of dental chairs, or with Turkish upholstery—soft and with springs; or with summer seats and back—of cane; or with separate sets of all of these, which can be changed from season to season by the owner without difficulty or the necessity of employing mechanics of any kind.

Its movements are very rapid.

It can be raised from its lowest position, in which the seat is 15 inches from the floor, to its highest, 42 inches above the floor, in seven seconds. Both low

and high based chairs are here combined in one, giving a vertical range of more than two feet.

It has no equal in operations upon Children.

The child can be raised as high as needed by the tallest operator.

It is provided with a comfortable back and head-rest, exactly as is a grown person.

The foot-stool is quickly adapted to children of any size.

It is extremely simple.

The principal movements of the chair and head-rest are all under control of but three clamps, and the chair is adjusted in height by a single crank.

By one of the above-mentioned clamps it is securely fastened at any desired inclination, and all done in an instant.

It is very durable, because

1. Being made almost entirely of metal, open joints or season cracks are impossible.

2. The upholstery of this chair is so arranged that it can be renewed, by exchange of the upholstered parts, without leaving the rooms of the operator and at moderate expense.

ACCESSORIES.

CASTORS.—To secure the *rotary movement* for such persons as desire it, legs have been cast, having recesses in the feet, into which Castors are inserted. The castors in the front legs roll laterally only, so that by them the patient's face may be turned to the light. When in the right position a locking device permits you to fasten the castors so that they cannot be moved until unlocked. The castors in the back feet are so placed as to revolve only back and forward, so that while they permit you to easily roll the chair like a wheelbarrow out of position if you wish to sweep, they cannot be moved by the force exerted in plugging a tooth.

NARROW BACK PAD.—To be used sometimes instead of the top pad, and sometimes as a third pad when the back of the chair is stretched to full length.

SPITTOON ATTACHMENT—see in the cut—is a cheap and convenient substitute for a separate spittoon. Is more convenient and costs less.

HEAD-REST.—The Morrison Head-Rest is a *thoroughly* good one, and has given general satisfaction. It is supplied with the chair if we are not otherwise directed, and the price of the chair as named includes this rest. The Johnston Head-Rest is *our latest*, and is everywhere approved. It can be had with the chair at an extra cost of $8.00. It is shown in the cuts.

EXTRA UPHOLSTERY.

Turkish Upholstery.

Some persons having desired a softer style of upholstery than is usual in dental chairs, we have adopted, after many experiments, a modification of what is usually known as the Turkish chair. The seat is made about four inches higher in front than at the back, and both it and the lower back are made very soft by the liberal use of steel springs and hair, the edges being kept full by a piece of heavy spring wire which is built into the upholstery.

The perpendicular edges are covered with a puffing to match, and "set off" with handsome silk cord.

The arms and upper back pads are made heavier than usual, and are puffed and corded to match the seat.

Real Morocco.

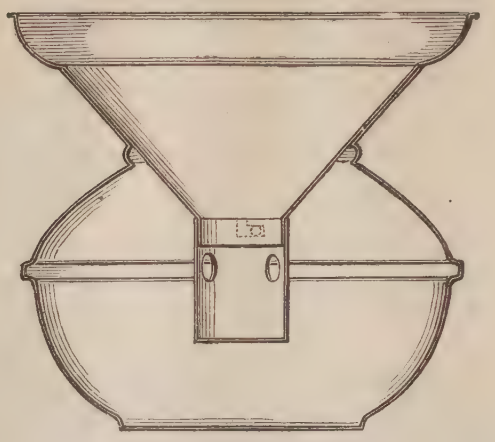
We also have produced a very elegant article by the use of real morocco, handsomely embossed. It is durable and particularly desirable for warm climates.

PRICES.

In fine green or garnet plush—with Morrison Head-rest	$ 150.00
Boxing	5.00
To which price add, if ordered:	
With Castors	10.00
With Johnston Head-rest, instead of Morrison	8.00
With extra back-pad	4.50
With spittoon attachment and porcelain cuspador	8.00
With nickled metallic cuspador and gold trap	10.00
With nickled metallic cuspador and gold trap, and nickled spittoon attachment	18.00
With Turkish upholstery	15.00
Real morocco embossed	10.00

NICKEL PLATED CUSPADOR WITH GOLD-TRAP.

CUSPADOR.



Section of the cuspador, showing the Funnel with gold-trap attached.

The cuts represent a metallic cuspador, handsomely nickel plated throughout, designed to fit the spittoon attachment of the Morrison Chair. As the funnel can be removed by simply lifting it from the Cuspador, all parts are as readily cleaned as is the porcelain Cuspador now in use. The gold-trap—which is an attachment of the funnel—will, in a short time, effect a saving sufficient to pay for the Cuspador.

PRICES.

Spittoon Bracket, plain.....not pictured.....	6 00
" " Nickel Plated— " "	8 00
Nickel plated Cuspador and Funnel with Gold-Trap.	$10 00
Funnel and Gold-Trap.....	3 50

JOHNSTON BROS.,

Broadway, cor. 32d St., N. Y

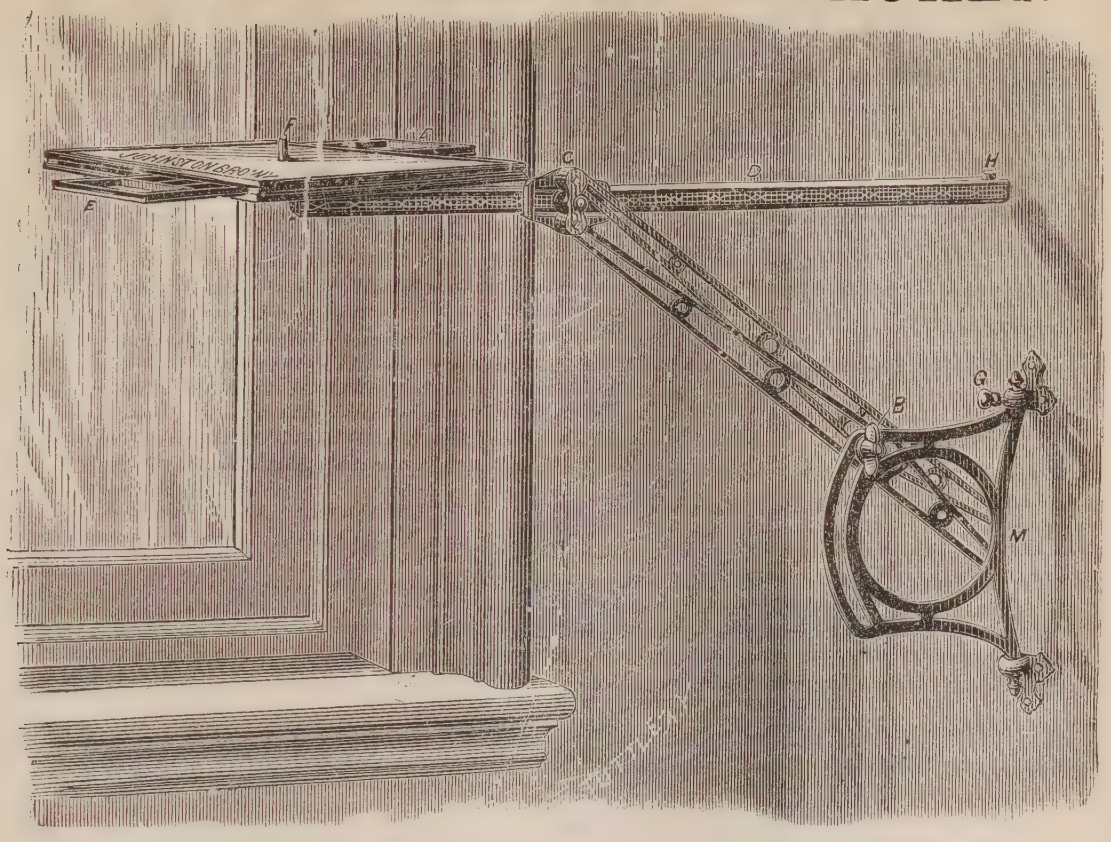
TOOTH BRUSHES.

A first-rate article.

4 Row Brushes, per dozen.....	$3 00
5 " " "	3 80
Children's Brushes "	2 30

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.

MORRISON DENTAL BRACKET.



PRICES.

With Black Walnut Table, 12 inches square.....$25.00.
With Rosewood Table, 14 inches square, and Velvet Top, and Drawers about five-eighth inch deep, lined with Leather..... 40.00.
The Rosewood Table alone, as above, to fit any Morrison Bracket..... 17.00.
Boxing.....$1.00.

The cut represents the table in its highest position, and distant from the wall a little more than half the distance it is capable of taking. By loosening the thumb-screw B, and allowing it to rest in the bottom of the slot, (instead of at the top as represented here,) the table will occupy a position as much below M as it now does above the same point. The extreme range, that is, the distance between the table when at its highest and its lowest position, is 24 inches.

M represents a metal frame which is secured to the wall or other support by screws. It swings from side to side as a gate on its hinges. C. M. represent light but strong metallic arms, hinged at M as a centre and moving up or down. At B is a thumb-screw passing through a slot in the frame M. By it the arms can be firmly clamped at any desired height.

At C is a slide-rest through which the hollow rod D passes freely, and may be clamped at any distance from its ends. At one end of this bar a square table is supported, having in it foil and instrument drawers. This table is capable of rotation round F, which is the burner of an alcohol lamp, the alcohol being contained in D and introduced at its further extremity H. Among the advantages of this bracket are these:

1st. It combines a greater variety of range and movement than any other.
2d. It is rigid in whatever position it is clamped, and will hold 15 lbs. with steadiness.
3d. It provides a clean receptacle for foil and instruments.
4th. It is obvious that a square table is very much more convenient as an instrument stand than a round one.
5th. Its drawers extend through the table and can be opened from either side.
6th. To those having a Morrison Chair it is almost indispensable, as it will follow the chair to either its lowest or its highest position.

It is handsomely ornamented and nickel-plated throughout, so that it is a very beautiful addition to the furniture of the operating room.

JOHNSTON BROTHERS,
Broadway, cor. 32d St., N. Y.

LIQUID NITROUS OXIDE.

N O

No other equally safe anæsthetic is known. While Chloroform and Ether are killing scores, if not hundreds, annually, Nitrous Oxide, although used many times as frequently as either of the other anæsthetics named, proves itself entirely harmless; and this too, though very commonly an impure article of Nitrous Oxide is exhibited. The Nitrate of Ammonia ordinarily furnished in the market is far from being chemically pure, and the products of its decomposition are too often impure Nitrous Oxide and Bin-oxide of Nitrogen. The latter is a gas of which the chemist, Brande, says:—"It is rapidly fatal to animals"—and again, (of the reddish fumes which result from its admixture with air, which fumes most dentists have seen while making Nitrous Oxide,) "These are fumes of Nitrous Acid, ($NO^2+2O=NO^4$). They have a peculiar suffocating odor, and are highly irritating and corrosive—*care should be taken that they are not breathed, even in a dilute state.*" All danger from this source may be avoided, however, by making use of *Liquid* Nitrous Oxide, which, being prepared constantly and in large quantities, under the direct supervision of a chemist, is certain to be pure. *No instance* of fatal results following the administration of pure Liquid Nitrous Oxide Gas is known. The following statistics, showing the comparative safety of several of the leading anæsthetics, have been before given by us, but cannot be too often brought to the notice of those who are constantly called upon to relieve suffering by means of these agents.

From a careful examination of the statistics of 200,893 cases, Prof. E. Andrews gives, in the *Chicago Medical Examiner*, the following estimate of the relative danger from different anæsthetics:

Sulphuric Ether	1 death to	23,204	administrations.
Chloroform	1 "	2,723	"
Mixed Chloroform and Ether	1 "	5,588	"
Bi-chloride of Methylene	1 "	7,000	"
NITROUS OXIDE	**no Deaths in**	**75,000**	"

Edward R. Squibb, M.D., than whom our country has no more able pharmaceutist and toxicologist, in a lecture on anæsthetics before the Medical Society of the State of New York, says: "Nitrous Oxide was the first anæsthetic; and the safety and certainty of its effects, even in inexperienced hands, for all momentary operations, and the promptness with which persons recover from its use, render it perhaps the most important of all anæsthetics, because destined to relieve a greater aggregate amount of pain, *with greater safety*, than any other agent."

Again—"If the surgeon considers the safety and saving of pain to his patient, first, and his own convenience in operating, second, he will hesitate before passing over such an agent as Nitrous Oxide."

It may be well just here to call attention to the fact that, when ether or chloroform is administered, it is not at all uncommon for the air about the patient to become so charged with the vapor as to somewhat affect the surgeon, taking from him perfect clearness of mental operation, and of the senses, and frequently leaving him with headache, and even nausea.

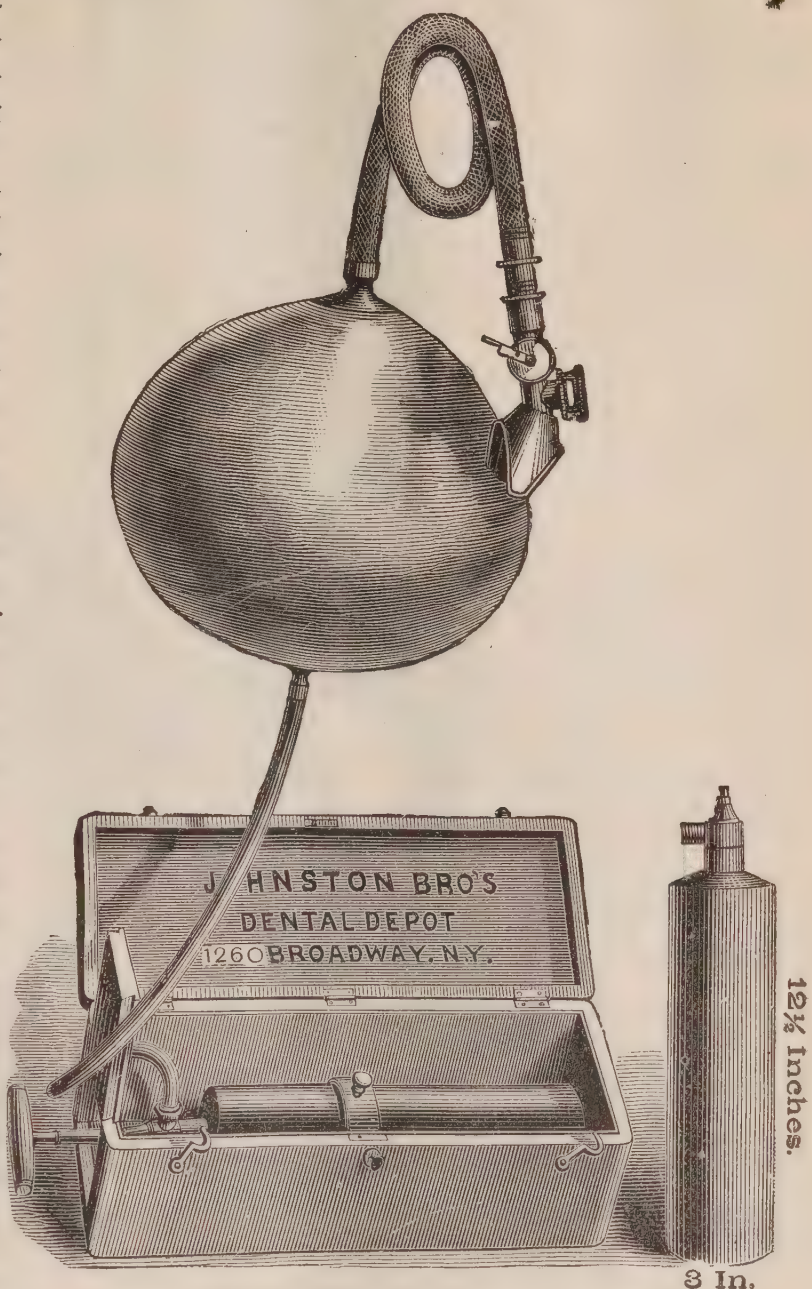
When Nitrous Oxide is given, nothing of this occurs, and the surgeon is in no way conscious of the presence of the anæsthetic, except as he sees its effects on his patient. This, we think, is a convenience to the surgeon.

Numerous and repeated trials of the Liquid Nitrous Oxide in capital operations in surgery, (as well as in momentary operations), during the two years just passed, attest the

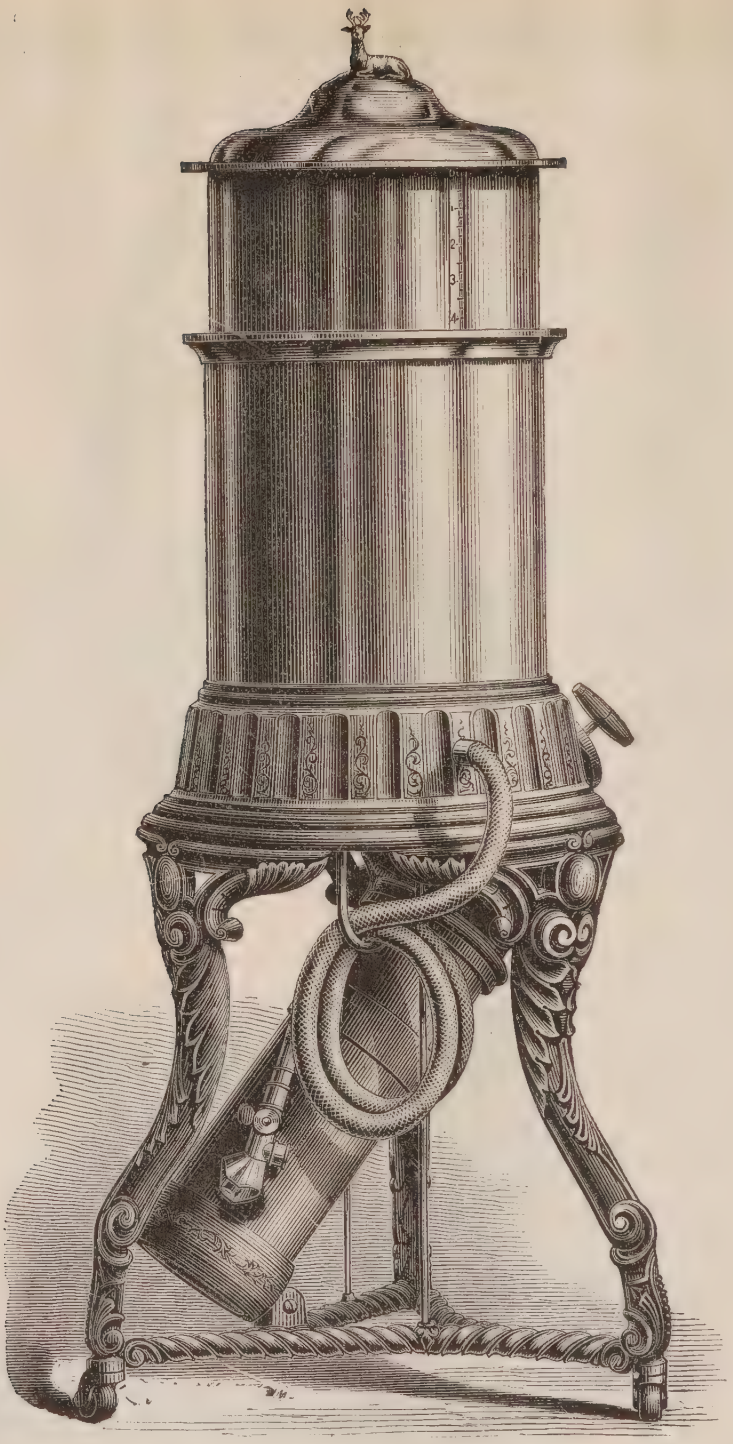
perfect adaptability of this agent to all cases where an anæsthetic is needed, and the time is not very distant when it will supplant its cheaper, but dangerous rivals.

Two styles of apparatus are provided for its administration. The most generally used, because of its cheapness and portability, is the SURGEON'S CASE.

This comprises a strong cylinder containing One Hundred Gallons of Gas; a strong morocco covered case, provided with an iron ring and set screw, by which the iron cylinder is held in place during use, and its delicate valve protected from injury; also, a rubber bag with rubber tube at one end for admission of gas, while an inhaling tube, handsomely covered on its outside, and provided against any possibility of a collapse by a tin-coated spiral of wire on its inside, is fastened at its opposite end; a metallic inhaler—nickled—having two spring valves, which answer to the slightest breath, either of inspiration or exhalation. The inhaler also has a two-way stop-cock or ground valve so arranged, that the gas being shut off, the patient may be allowed to breathe air until all alarm is dissipated, and then, by an unobtrusive movement of the fingers without previous notice, the air may be excluded and gas admitted. It contains also, a nickel-plated wrench and a nickel-plated key. In fact *all* the apparatus necessary for administering the gas. The whole case and contents weighs about fifteen pounds. This is here shown as open, and the bag which receives the gas from the cylinder, and from which it is exhibited to the patient, is represented as filled, and suspended above the case. The cylinder is also shown as standing at the side of the case. This is the simplest and most popular form of apparatus, and will be everywhere welcomed—because of its portability for use outside of the operating room.



SURGEON'S CASE.



NICKEL-PLATED GASOMETER

AND ORNAMENTED STAND

FOR LIQUID NITROUS OXIDE.

NICKEL-PLATED GASOMETER.

This style of apparatus is especially designed for those who use large quantities of Nitrous Oxide, or who may desire a highly ornamental piece of office furniture, coupled with a *really economical* gas apparatus, the gas being furnished in 1,000 gallon cylinders, at a reduction of 25 per cent. in price.

The cut on the opposite page represents the nickel-plated gasometer, mounted on a stand, with a 1,000 gallon cylinder, in position, under the gasometer.

Heretofore, gasometers have been so unsightly, that it has been considered desirable to place them in an adjoining room or behind a screen; we take pleasure now in offering to the profession a gasometer so handsomely gotten up, that it will be an ornament to any office, and at the same time so constructed, as to be vastly superior to any apparatus heretofore used. The gasometer will, when full, hold 10 gallons of gas —this is sufficient to completely anæsthetize any patient. The usual amount of gas given to a patient is from 3 to 5 gallons.

If it is desirable to keep the patient under the influence of the anæsthetic for any length of time, (as in a surgical operation), the operator has under his control 1,000 gallons of gas, by merely turning the key seen in the cut at the right. The gasometer is nickel-plated, highly polished, and mounted on a carved iron stand, which is japanned and ornamented with bronze.

On the bell of the gasometer there is a scale graduated in gallons, and fractions of a gallon, so that the operator can readily see how much gas he has administered.

Another valuable feature in this gasometer, is a peculiar water-check or valve, so arranged that though the gas will flow freely on the lightest inspiration at the inhaler, it is instantly and automatically shut off by the water when the patient stops breathing.

This does away with the necessity of closing any stop-cock, and prevents all waste of gas; it also saves the dentist's time at the most critical moment, as he has only, after having administered the gas, to lay aside the inhaler and proceed at once to operate without the necessity of shutting any stop-cock. The stand is so constructed that a small (100 gallon) cylinder can be used while the large cylinder is being re-filled.

We should also call attention to the fact, that there is no liability to loss of gas from leakage, caused by the operator's leaving the valve of the cylinder open, for if there is such escape from the cylinder, the bell of the gasometer will rise, and the operator will have his attention called to the waste, thus enabling him to correct the difficulty at once.

The whole apparatus is mounted on castors, and can be readily moved.

This apparatus is especially desirable where large quantities of nitrous oxide are used, or where it must be sent a great distance. In this form it is best to ship it by *fast freight*—which makes the cost of transportation very light. The gas can be kept for any length of time, and is constantly on hand *and always of the best quality.*

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.

Why Nitrous Oxide should be preferred to Ether or Chloroform.

1st. It is far safer—see foregoing statistics. Dr. Colton reports having administered it to thousands of patients, without a single accident.

2d. It acts quickly; from one to two minutes being generally sufficient to bring a person completely under its influence.

3d. It seldom excites a patient to violence—a matter of great importance.

4th. Nausea is not often excited, even during a long operation. Eating, however, should not immediately precede the administration of the gas. It is contended by some operators of large experience, that *pure* nitrous oxide *never* causes nausea. In operations of the eye, or in the pelvic region, this peculiarity renders the gas invaluable, and it always is of much value to the patient's feelings.

5th. The shock given to the system by other anæsthetics, is almost as severe as the operation itself, and a slow return to consciousness and the normal condition detrimental to the recovery of the patient. Nitrous Oxide frees itself from the system as speedily as it produces its effects, and so adds nothing to the perils of surgery.

6th. It is no small advantage, as before recited, that, while using Nitrous Oxide, the operator feels no inconvenience from its effects, as he does not inhale it, while he cannot altogether escape the fumes of ether or chloroform.

REVISED PRICES.

Complete Apparatus—Surgeon's Case, with Metallic Inhaler	**No. 1**	$42 00
Complete Apparatus—Surgeon's Case, with extra sized Bag and Metallic Inhaler	**No. 2**	44 00

Boxing either, $1.00.

Each complete apparatus includes a 100 gallon cylinder, filled with Liquid Nitrous Oxide.

Cylinder with 100 gallons of Gas	16 00
Refilling Cylinder	6 00
Nickel-Plated Gasometer, with ornamented iron stand	128 00
Necessary adjuncts, (including Union Nut, Key-Wrench, Inhaler and covered Tubing)	12 00
1000 Gallon Cylinder	36 00

The above cylinder may contain more than one thousand gallons—say from 1000 to 1200 gallons—for which the price will be at the rate of 4½ cents per gallon, which is 25 per cent. less than the price in small cylinders.

Contents, if 1000 gallons would be, at 4½ cents	45 00
Morocco covered case, with ring and thumb screw, velvet lined	12 00
Polished bl'k walnut " " " " "	13 00

Or these latter we have only a limited number.

Rubber Bag, with covered inhaler tubing, (about 4 gall. capacity)	5 00
Rubber Bag, with covered inhaler tubing, extra size	7 00
Inhaler, latest style, with two way stop cock, adapted to the use of both dentists and surgeons, with connection	9 50
Key, Nickel Plated	1 50
Wrench, "	50
Union, Nickel Plated, (nut and tube), for connecting cylinder and gas bag	1 50
Covered Inhaler Tubing, per foot	50
Plated Connection to fit old style Inhaler	1 00

JOHNSTON BROS.,

[illegible]adway, cor. 32d St., N. Y

NITROUS OXIDE GAS.

100 GALLON CYLINDER TRIPOD.

PRICE, $4.00.

We here show a representation of a tripod, handsomely japanned and ornamented, which is designed to hold the cylinder while in use, and is less expensive than the Morocco case, of the Surgeon's case.

Price adapted to 100 gall. cylinder.....$4.00.
" " " 500 " " ..... 6.00.
" " " 1000 " " ..... 8.00.

ADJUNCTS NECESSARY WITH EITHER TRIPOD, VIZ.,

Bag, Inhaler, Key, Union-Nut and Wrench..... .....$17.00

For other prices of Gas apparatus, see pages following.

SUSPENSION DENTAL ENGINE.

(INVENTED BY DR. W. S. ELLIOTT.)

The Dental Engine represented in the accompanying plate is confidently recommended by us as sure to give general satisfaction.

Two or three years ago a few engines modeled on this, the Elliott, plan (suspension from the ceiling) were sold. Though imperfectly constructed, they have been uniformly commended by those who have used them.

Each of the two styles of Dental Engines which have found favor with the profession has advantages peculiar to itself.

In this form the driving power is belted directly to the shaft of the hand-piece, without the intervention of a flexible joint, and so *entirely avoids all the unsteadiness* or "chattering" which is almost inseparable from the flexible joint, even when short, and is unendurable where the non-rigid portion is long.

The Remodeled Engine, shown in our cut, has not only greater elegance of design than the Suspension Engine as previously sold, but, by its construction, obviates several objections to which the earlier model was liable. It was previously necessary to make the hand-piece large and heavy in order to give tension to the belt, and in furtherance of this purpose a considerable ball of metal was suspended from the rear of the hand-piece. As now made, the ball weight is dispensed with, the hand-piece being balanced and tension given to the driving-belt by placing a small pulley on the hand-piece spindle. The hand-piece is reduced to half its original weight, *and the slightest movement at its point can now be felt by the hand which guides it.* Among its advantages, those subjoined are prominent.

1st. It is more steady in its movement than any Engine made.

2d. Being suspended on a cord, it is free to move in any and every direction—hence the bur can be readily applied to any cavity, whatever may be its position in the mouth.

3d. It has an abundance of power.

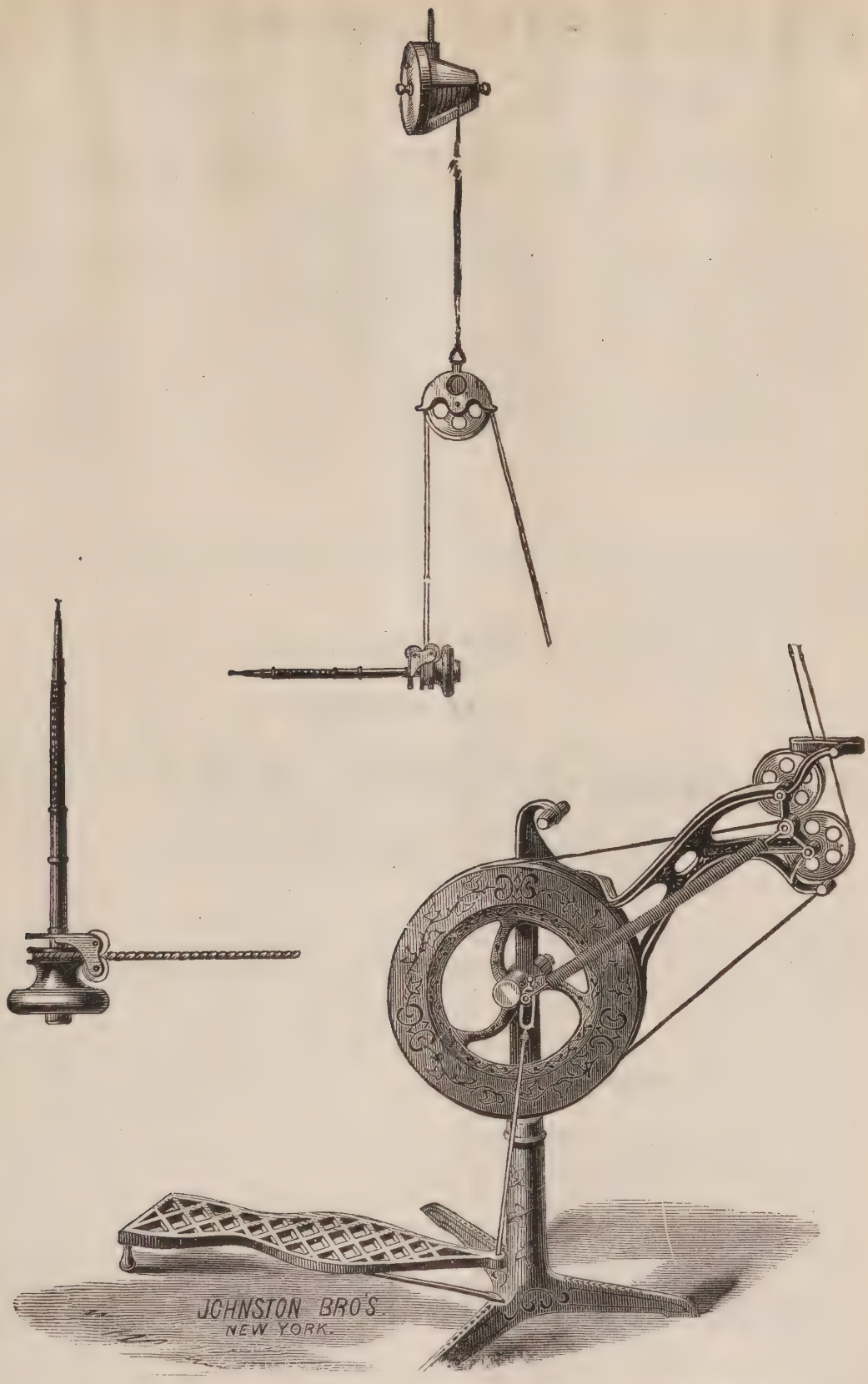
4th. It is not easily broken or likely to need repairs.

5th. It is, above all others, a "*light running*" Engine.

6th. The hand-piece, which formerly was particularly objectionable because of its size and weight, and because of the position occupied by the weight needed to balance it, is now scarcely larger than that of the Morrison Engine, and is fitted to use the same (C style) bur. For the balance-weight we have substituted *a fly-wheel on the shaft which carries the bur.* While keeping the hand-piece well balanced, this gives momentum and greatly increased steadiness to the cutting instrument.

Orders for this Engine will be entered in rotation as received, and promptly filled.

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.



SUSPENSION DENTAL ENGINE.

(Dr. ELLIOTT'S INVENTION.)

Price, $50.00. Right Angle Attachment, $5.00. Boxing, $1.00.

HARVARD UNIVERSITY.

DENTAL DEPARTMENT.

BOSTON, MASS., 1878-79.

The plan of study of this School has been radically changed. Instead of the usual oral examinations at the end of the course, written examinations are had at the end of each year on the subjects pursued during the year, and instead of the customary repetition each year of the lectures and studies of the preceding year, the course is progressive over a period of two years, and the student is required to pass a satisfactory examination in the first year studies before being allowed to proceed to the next. At the end of the course a satisfactory examination must have been passed in all the subjects.

The new year begins Sept. 25th, 1878, and ends the last Wednesday in June, 1879. It is divided into two equal terms, with a recess of one week at Christmas, and another in April.

The University Degree, D.M.D (*Dentariæ Medicinæ Doctor*), is conferred upon those who fulfill the requirements.

FEES.

There are no fees for matriculation, for the diploma, nor for the demonstrators. For the first year a student is a member of the school, the fee is $200; for the second year, $150; for any subsequent year, $50.

For information address,

THOS. H. CHANDLER, Dean,

222 TREMONT ST., BOSTON, MASS.

FRENCH CROWN AMALGAM.

The Manufacturer says of it: The Amalgam is composed of materials which the dental profession at large recognize as the best (except gold) for filling teeth. It is of finest quality. It has the merit of becoming hard in fifteen minutes after being prepared for use, and does not change color or shrink.

PRICES.

1 oz. box, with mercury	$3 00
⅔ oz. " " "	2 00
⅓ oz. in envelopes	1 00

For sale at wholesale and retail.

JOHNSTON BROS., 1260 Broadway, N. Y.

JOHNSTON BROTHERS' LAVA STRIPS.

PATENT APPLIED FOR.

For finishing fillings, a new and unequaled polishing material.

Thinner, more convenient and more efficient than corundum tape.

Price, per Box. ..... 50 cts.

JOHNSTON BROS., 1260 Broadway, N. Y.

JOHNSTON ADJUSTABLE FOUNTAIN SPITTOON.

The defects of the Fountain Spittoons hitherto made are, that it is almost impossible to keep them from leaking, and that they occupy a rigid position close to the left of the chair, and hence prevent the operator from working on that side.

These defects will not be found in this spittoon, which is commended to the favor of Dentists by the following points of merit:

1st. It is readily adjustable to the position of the chair; that is, it can by an easy movement of the hand be raised or lowered to suit the height at which the chair is placed at the moment.

2d. The normal position of its base is, say, eighteen inches to the left side of the chair, from which position its basin will ordinarily be inclined towards the chair and patient; but should the operator desire to stand on that side of his patient, the standard of the spittoon can be instantly inclined in the opposite direction, so as to be entirely out of the way

3d. Instead of a wooden case, twelve inches square, is an ornamented metal tube one and a half inches in diameter, which will not warp, occupies very little room.

4th. Movable joints are so arranged that any leakage is impossible, since the waste from the bowl never comes to the joint itself, but is discharged below, in the bottom of the lower half of the socket of the globe, and conveyed into the waste pipes.

5th. It is provided with a gold trap, and an operator of good practice now using the ordinary spittoon will be able to save enough gold in from one to two years to entirely reimburse himself for this purchase.

6th. All its bright parts are of gun metal, and its tubing silk covered.

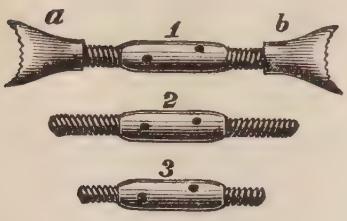
The water jet used is the device of Dr. Redman, of Louisville, Ky.

Price. $60.00
Boxing..... 2.00

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.

JACK SCREWS.

Devised by Dr. C. S. LONGSTREET, with Dr. A. MCCOLLOM'S Improved Head.



This device is greatly prized by those who have used it.

PRICES.

Full Set, as above, Nickel Plated, screw and two extra bars..$2.50
Jack Screw, Nickel Plated.....1.50
Bars, " " 50

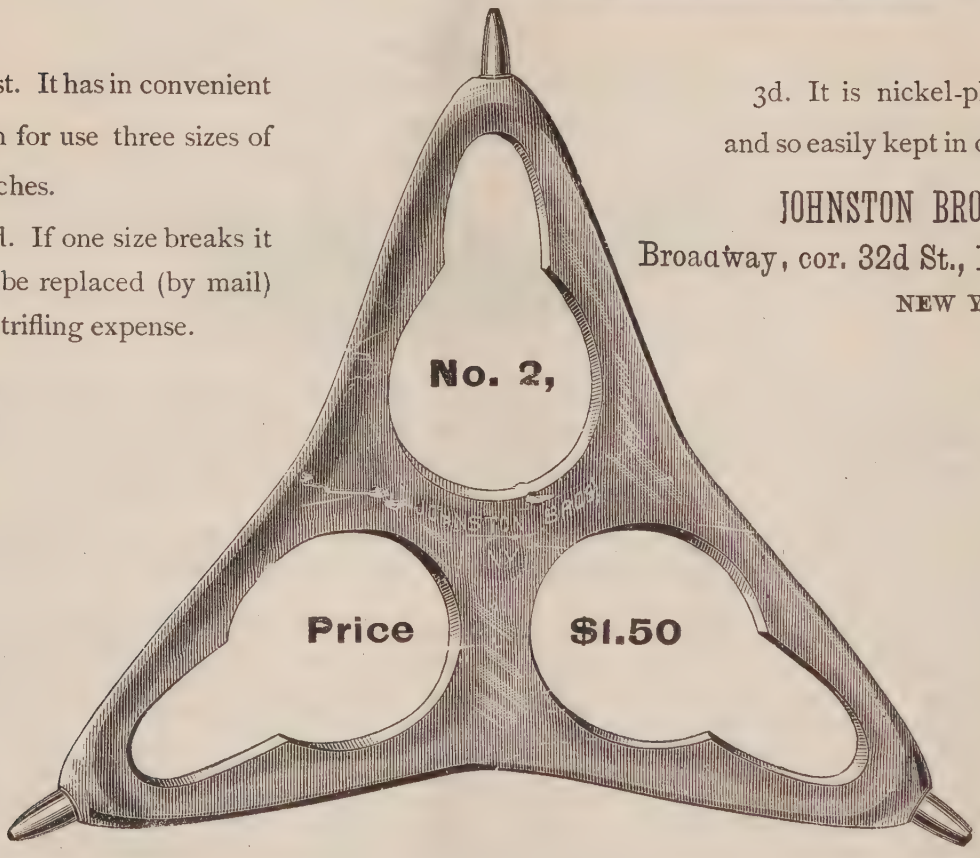
Improved Triplex Rubber-Dam Punch.

Devised by Dr. F. W. DOLBEARE.

TWO STYLES, Nos. 1 and 2.

1st. It has in convenient form for use three sizes of punches.

2d. If one size breaks it can be replaced (by mail) at a trifling expense.



3d. It is nickel-plated, and so easily kept in order.

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Broadway, cor. 32d St., N. Y.
NEW YORK.

SECOND-HAND CHAIRS.

Dentists who have supplied themselves with the Morrison Chair, frequently request us to sell the chairs previously used by them. We therefore can ordinarily supply, at cheap rates, second-hand chairs of any of the varieties hitherto most used. For particulars, address

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NEW YORK COLLEGE OF DENTISTRY,

1877–78.

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A. RUST CUYLER, D.D.S., Demonstrator of Mechanical Dentistry.

C. P. KREIZER, M.D., Assistant to the Professor of Chemistry, Materia Medica and Therapeutics.

S. FRANK JOHNSON, D.D.S., }
GEORGE M. EDDY, D.D.S., } Assistant Demonstrators.

Students may matriculate at any time, as the Infirmary is open for regular students of the College to practice in the entire year.

The regular course of Lectures will commence on Tuesday, October 2d, and continue until the latter part of February. Three hours of each day of the week (except Saturday) will be devoted to Lectures, and four hours to *Clinics*, and practice at the Chair and in the Laboratory, under the direction of the Demonstrators.

Our Infirmary is furnished with twenty-four good chairs and all the appliances. Our Lecture-room will seat, and our Laboratory accommodate, two hundred students; all on one floor, and up one flight of stairs only. There is seldom any lack of patients for students to operate upon.

Tickets for one year's Instruction, including Course of Lectures, Matriculation, Demonstrators', Diploma Fees, and practice in the Infirmary the seven and one-half months between the sessions...	**$150.00**
For the Course of Lectures only	**100.00**
Matriculation	**5.00**
Graduation Fees	**30.00**

Board may be obtained for from $6 to $8 per week.

For further information, address

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HARRISON ALLEN, M.D., Professor of Anatomy and Surgery.
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S. B. HOWELL, M.D., Professor of Chemistry and Materia Medica.
T. C. STELLWAGEN, M.D., D.D.S., Prof. of Dental Pathology and Op. Dentistry.
EDWARD L. HEWITT, D.D.S., Demonstrator of Operative Dentistry.
ALONZO BOICE, D.D.S., Demonstrator of Mechanical Dentistry.
HENRY I. DORR, D.D.S., Demonstrator.

THE DISPENSARY and Laboratory open all the year.

Spring Course of Lectures will commence on the first Monday of April, and continue until the last of June. *Fall Preliminary Lectures*, commencing Monday, September 4th, will continue daily until November. Like the Spring Course, their object will be to anticipate subjects presented during the Winter Session. *The Regular Winter Course* commences Monday, November 6th, and closes on the last day of February ensuing. Three hours of each day will be devoted to attendance upon lectures, which will be illustrated to the fullest extent by a large and valuable collection of Chemical and Philosophical apparatus, and Anatomical and Pathological specimens. Tickets for the Course, including the Demonstrators', $100; Diploma, $30; Matriculation (paid but once), $5. For further particulars address

J. H. McQUILLEN, Dean. S. W. Cor. 21st and Arch Sts.

SECOND-HAND DENTAL CHAIRS.

Harris—S. S. White—Snowden & Cowman—Perkins and other Chairs, with all movements in good order, but with Plush somewhat worn. which have made place for the new Wilkerson, are offered at large reductions from their cost. Send for descriptions to

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A DENTAL PRACTICE,

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FOR CASH ONLY.

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THE DENTIST'S APPOINTMENT BOOK

AND POCKET RECORD.

Printed in Carmine and bound in Morocco, with rubber fastenings and card pocket, $1.25

JOHNSTON BROS.

DENTAL PICTURES:

Pictures on Dental subjects are not very numerous, and will always possess interest to practitioners of dentistry. Having reproduced several copies of ancient paintings and engravings, illustrative of dentistry in other countries and in olden time, as frontispieces for the DENTAL MISCELLANY, we have, at the request of friends, also printed them upon plate paper, in suitable form for framing or for preservation in a portfolio.

Those now ready are—

1. Der Zahnarzt—From a Steel Engraving of 1672.
2. The Tooth Drawer—English.
3. The Monkey as a Dentist—From a painting by DeCamps, 1840.
4. Der Zahnbrecker—From a German Plate.
5. Transplantation—1787. By Rowlandson.
6. The Ludicrous Operator. By J. Harris, London, 1768.
7. Primitive Dentistry. Scene in Persia by an eye witness.
8. Fifth Pair of Nerves—not colored. From Tomes' Dental Anatomy.

Price each, by mail, 50 cents.

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FLOSS SILK.

A superior article, per dozen, $1 50.

JOHNSTON BROS.,

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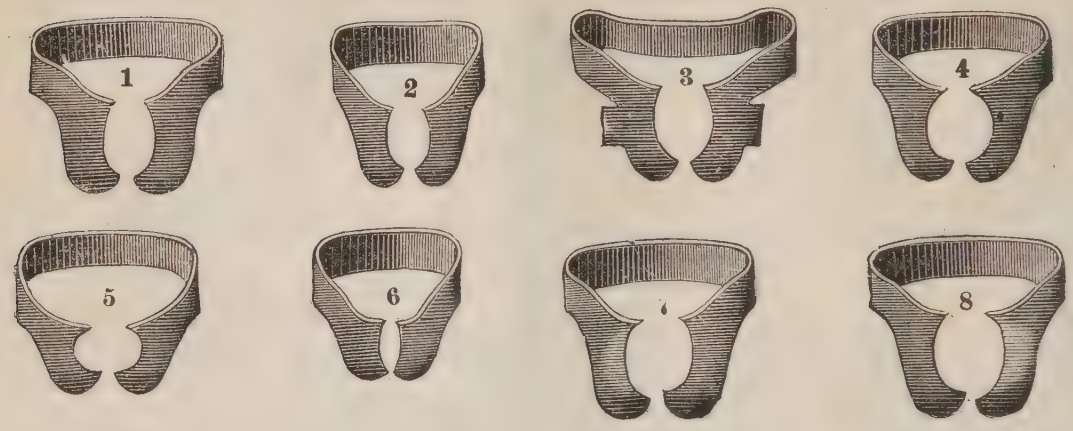
We were never more sure of doing signal service to the Dental Profession than now in offering the

IMPROVED

Rubber Dam Clamps,

INVENTION OF

DR. DELOS PALMER, OF NEW YORK.



Price, set of Eight, { Oil finish, $4.00. Each plain, 50 Cents
Nickel plated, 4.80. " Nickeled, 60

For use with Rubber Dam Clamp Forceps.

These Clamps are designed to be placed on the tooth at the commencement of the operation. Afterwards apply the Rubber Dam by passing it over both tooth and clamp.

DESCRIPTION.

Nos. 1 and 2.—Universal Clamp for Molars.

No. 3.—For posterior cavities in molars standing alone.

No. 4.—For third molars, or any molar of a cone shape. This Clamp can oftentimes be turned around while on the tooth, so as to place the bow of the Clamp out of the way of the operator.

No. 5.—For biscuspids.

No. 6.—For lateral and central incisors.

Nos. 7 and 8.—RIGHTS AND LEFTS.—For cavities under the gum, on the buccal or lingual surface of molars.

Cuts of two favorite styles of Rubber Dam Clamp Forceps will be found on another page.

These Clamps have prominent points of marked superiority over those of other manufacturers.

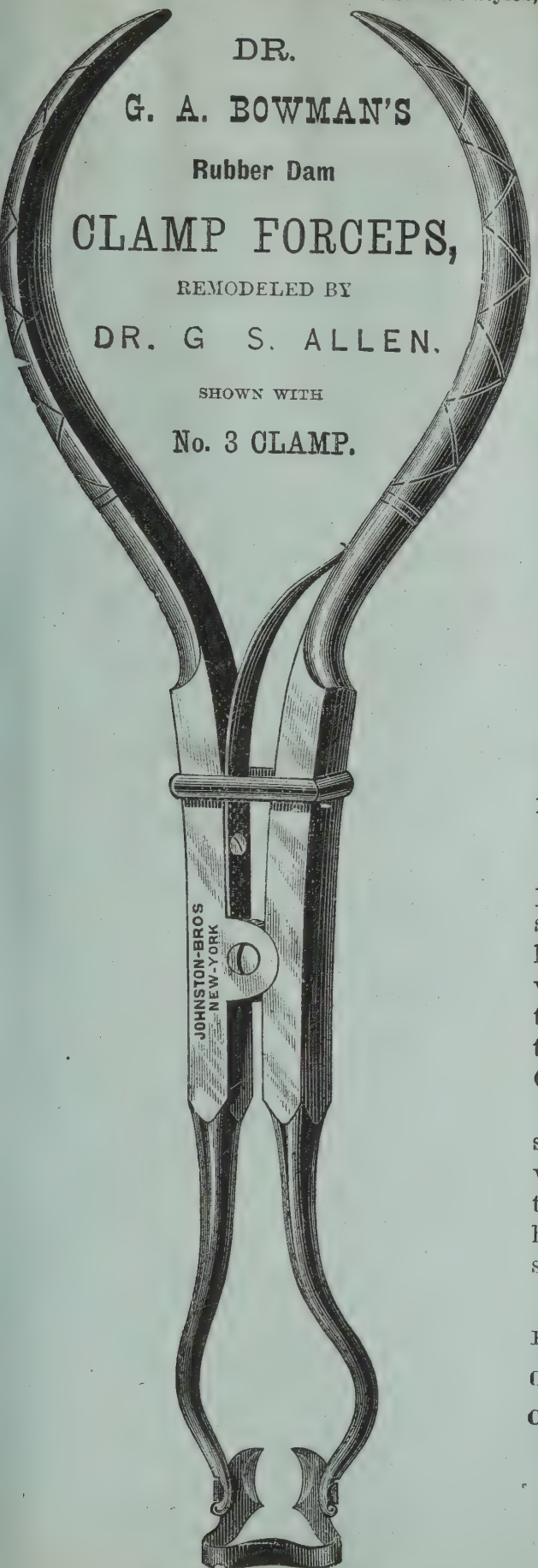
First. Each has been carefully adapted to the shape of the tooth for which it is designed, *under the personal supervision of Dr. Delos Palmer,* the inventor.

Second. A groove is made by us in the clamp, into which the forceps nicely fit, so that the clamps firmly hold their position on the forceps, when once adjusted, instead of tilting from one position to another—as is the case when no groove is provided.

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.

RUBBER DAM CLAMP FORCEPS.

Of these we offer two styles, both deservedly popular.



POINTS OF DR. T. C. ROYCE'S

Rubber Dam Clamp Forceps,

Shown with Clamp. Handles are exactly like the other style, (Bowman's.)

Both styles of these Forceps have points accurately adapted to the shape of the clamp at the neck, and hence will be found much more convenient than those hitherto offered the profession in this point of adaptation. (See also advertisement of Clamps.)

If so ordered we can supply either style of Forceps with a band, which will keep the Forceps and Clamp extended and ready for use when the hand of the operator is removed, as shown on the Bowman Forceps.

PRICES.

Forceps, either style	$3.00
" " " Nickel Plated	3.50
Complete set of Clamps, embracing eight forms	4.00
Complete set of Clamps, embracing eight forms, plated	4.80
Clamps, each	50
" plated	60

JOHNSTON BROS.

Broadway, cor. 32d St., N. Y.

1878.

JOHNSTONS'

Dental Miscellany

A MONTHLY JOURNAL

OF

AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL AND MECHANICAL LITERATURE.

Its Contributors are Eminent Writers and Practitioners.

It will contain Prize Essays upon the important improvements of the day.

It will contain illustrated articles from Dr. NORMAN W. KINGSLEY, on the treatment of Cleft Palate, Deformities of the mouth, Regulating of Teeth, &c.

The commendation of the Miscellany, received during the last year, has gratified its publishers greatly. They purpose to make the volume for 1878 superior in all respects to either volume that has preceded it. This will be—

1st. Through more frequent contributions from the regular writers who have hitherto favored it, and by promised essays from equally capable practitioners, who have not as yet written for its pages.

2d. By the further reproduction of engravings upon dental subjects. Three such have already appeared, and others are in course of preparation.

3d. By the constant search for, and publication of items of office practice, which serve to show the methods adopted by eminent and experienced dentists to overcome the little perplexities of every-day practice, and to shorten the operations in both laboratory and operating room.

4th. By the reproduction of matter of especial interest which may appear in foreign or comparatively inaccessible publications.

In short, it shall be the constant effort of the editor and publishers to make the DENTAL MISCELLANY of practical value to every actively employed dentist, as well as a source of literary enjoyment to its scientific readers.

TERMS OF SUBSCRIPTION—IN ADVANCE.

One Copy, one Year, postage prepaid, - - - - - - *$2.50*

Single Numbers, - - - - - - - - - - *.25*

PREMIUMS.

One-Half Ounce of "Premium" Gutta Percha Stopping, value, $2.50.

Or Colored Plate of Fifth Pair of Nerves,

Or Steel Plate of Evangeline,

Or Clapp's Saw Frame and two dozen Saws.

SPECIMEN COPY SENT FREE.

JOHNSTON BROS., PUBLISHERS,

1260 BROADWAY, NEW YORK.

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Dental Miscellany,

A Monthly Journal of

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JOHNSTONS'

DENTAL MISCELLANY

FOR 1878.

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Dental Miscellany.

VOL. V.——*July, 1878*——No. 55.

GOLD CAN BE SO MANIPULATED AS TO MAKE OPERATIONS PERMANENT.

BY MARSHALL H. WEBB.

Chalk is carbonate of lime, and there is none of this in any dental tissue; therefore, no tooth can be compared, in any way whatever, to "a little block of chalk." In the DENTAL MISCELLANY for April, 1878, Dr. C. M. Wright, of Basil, Switzerland, has attempted to make such a comparison, but he has only again demonstrated that he is not fine enough in his perceptions (and cannot, therefore, be accurate enough in his manipulations) to be a good judge and a thorough and skillful operator.

When operations have been so performed as to entirely prevent fluids from entering between the gold and the tissue or tissues, against which it has been built, there is certainly the same action going on in the protoplasmic elements between the enamel prisms, as before, but this process is a fulfillment of a law in the animal economy, and is not to be compared to the simple infiltration of fluid through the wall of a cylinder of non-living vegetable tissue (such as Dr. Wrights' "rattan model"), and to the gold which may be placed in it.

Dr. Wright asks, "How long should a filling remain to be considered permanent?" If gold (or any other material) is used as a simple "stop-

ping" it will, in all probability, be only "temporary," but in the hands of properly qualified and skillful operators, it can be so manipulated as to make operations permanent. Permanent signifies "continuing in the same state, or without any change that destroys form or character; remaining unaltered or unremoved; continuance in the same state or place; duration; fixedness."* So far as the materials used in the performance of dental operations are concerned, therefore, gold is the only material that can be made to answer all these requirements. Operations can be so performed as to prevent further disintegration of enamel about the parts against which gold has been well impacted and finely finished. Gold can be so manipulated as to aid in the preservation of the teeth so long as the organ or organs operated upon are not attacked by caries in other parts, and until solution and absorption of the alveolar process akes place, and the teeth loosen and fall out, or till the death of the patient, and the remanding back of the elements of the tissues to their primal condition.

We are having no "earthquake," such as Dr. Wright refers to, in America, but there are practitioners who are *Flagging*, and attributing the cause of failure in dental operations to gold as being incompatible with tissue, when in reality the principal cause of failure consists in their incompatibility with their calling.

In such cases as Dr. Wright refers to as coming in for treatment in Switzerland—in very many cases everywhere—function has been interfered with or interrupted, or nutriment has not been sufficiently rich and abundant, and tissues have not been perfected, and it is in just such cases that the most thorough and careful treatment and perfect operations are required. If an operator does not possess the ability to properly perform an operation with gold, it were better for him to insert another material than to extract or cause the loss of the organ. In teeth, where calcification has not fully taken place, and where the interglobular spaces, filled with larger protoplasmic elements, might yet be found, it is of the utmost importance to so perform operations, when disintegration penetrates the enamel upon a proximate surface of a tooth, as to have the gold built out to the original contour of the missing tissue, and to come closely in contact with that which may be inserted in, or with the normal tissue of, the adjoining tooth. Each such operation should be so performed that the enamel, against which the gold has

* Webster.

been built and finely finished, shall be free from contact at every part, and be washed by the saliva.

With proper hygienic management, the tissues of such organs as have just been referred to, will gradually but surely become more fully calcified and perfected, year by year, so that at maturity the acid conditions, concomitant with active carious processes, will be no longer present, to the same extent, and the teeth be of that character not liable to be attacked by destructive agents. Each operator should do all that he possibly can to preserve the pulp in every case presented, and especially in all cases where the tissues of the body have not matured. It is even better to retain a pulp that is in a semi-vital condition than to destroy it while the patient is yet in his or her teens, because, in youth, the balance is in favor of supply of pabulum, not only to sustain but to perfect tissues.

It is not only necessary for one to possess the genius of an artist to become a first-class operator, but he must also be an anatomist and histologist ; a physiologist and pathologist ; an etiologist and a therapeutist, and be able to intelligently apply remedial agents for the "removal of abnormal functions and abnormal growths, that the physiological energies may hold normal sway in the production and maintenance of the elements of the tissues and organs." It is not of so much importance to "employ gold, amalgam, tin, oxychloride of zinc, gutta percha and judgment," and to "use gold in cylinders, pellets, strips, balls, ribbons, mats, ropes, blocks, &c., &c. (none of which forms are the best to use), or to "employ automatic and engine mallets, and pretty Swiss girls as vital mallets (?), hand-pressure and all other well-known methods" (excepting the very best) ; it is far better to condsider *how* all these things can best be employed—how operations can best be performed by their aid. There are very many practitioners in almost every part of the world who have "modern chairs, stools, dam-appliances, engines, instruments, &c.," and each might be "an earnest and enthusiastic *dentist*," and yet by no means a capable and skillful operator.

Several years ago a thoroughly educated, honest and conscientious practitioner, and first-class operator, was called to give a clinic before the Iowa State Dental Society. He took with him the instruments which he usually employed to perform operations, and after giving a clinic he learned that a practitioner, who was present, had said that it was "easy enough for Dr. Atkinson to perform such an operation with such fine instruments," whereupon the same practitioner was invited to witness

a clinic to be given the following day by the same operator. When the time arrived for the performance of the second operation, a simple file was made into an excavator (by the operator) and the cavity was prepared; when this was done, the same point was made into one of a proper shape for inserting the gold, which was all impacted by the aid of this same crude instrument, and a plain hand-mallet or hammer. After this was done, the same end of the file was made into a chisel and, by this means, together with the file-cut surface of the file, the surface of the gold was smoothly finished, and the operation was equal or even superior to the one performed the day previous by the aid of fine instruments. In this case, the successs of the operation depended upon the genius of the operator, and not upon the use of appliances.

Dr. Wright states that the "filling of teeth is a very absorbing occupation, but it is not a *fine art.*" An operation can be made a work of "*fine art*" if the operator be really an artist. "Our monuments" *do* "express the nobler sentiments of the human mind" if the operator has the ability to "express" and the mind have the "nobler sentiments." Most of the patients of a thoroughly conscientious, capable and skillful operator "really appreciate the work we do" more than the majority of "our craft," because such majority do not know what fine operations are—what "*fine art*" is. Could we but "see ourselves as" this same majority of so-called dentists have led "others" to "see us," there are but comparatively few who would have any enthusiasm, without which key-note real success cannot be attained. While it may require an encouraging word (as in the case of Michael Angelo with his Madonna), to kindle that inspiration which leads to the production of a work of art, yet all artists obey the behests of genius without taking into the account the mere opinions of others. When we are governed by the "nobler sentiments of the human mind," as other artists are, and do all in our power to perform first-class operations, and make each and every operation a specimen of "*fine art,*" then will we deserve and have "brotherhood with the painters and sculptors" (which latter we ought to be), and also to be the "architects" not only of fine work but of our own "fame" and that of our calling.

Correction.—In May issue, page 186, for "symphosis" read "symphysis;" fourth line from bottom of page, insert comma after Drs. Turner. On page 187, 10th line from top, read "malar" instead of "molar."

THE POISONS OF THE INTELLECT.

BY CHARLES RICHET, IN "REVUE DES DEUX MONDES."—1877.

(Translated by PROF. THOS. H. CHANDLER, *Boston.)*

Continued from page 227.

PART II.

HASHEESH, OPIUM, COFFEE.

It might almost be said that opium is to hasheesh what the ocean is to the Mediterranean. Hasheesh is only known in Syria and Lower Egypt, while upon the immense shores of the Pacific and the seas of China the trade in opium has reached a fearful extent. What interests us in Europe chiefly is that opium is of all medicines the most precious and the most employed; and, according to the saying of Sydenham, if we had not opium we should have to renounce medicine. Without wishing to undertake a complete investigation of this substance, we shall proceed rapidly to describe its effects on the nervous system.

Opium is the hardened sap of the poppy, and as there are several varieties of poppy, there are also several varieties of opium; but the manner of its collection is everywhere the same. In Egypt, in Syria, or in India, the three countries where opium culture is principally carried on, many semicircular incisions are made about the capsule of the poppy, and the sap which flows from them is very carefully collected. This sap, dried in the sun, becomes dark and thickened, taking the form of a brown and stiff paste, which is opium. What is called laudanum is a solution of this opium in alcohol; thus the properties of laudanum and of opium are identical. They should be regarded as a mixture of substances having analogous, but not identical properties. Since Derosne (1804) and Robiquet (1817), who first isolated narcotine and morphine, chemists have investigated with greater care the different chemical compounds mixed in opium; and thus have been discovered codéine, narcéine, thebaïne, papaverine, and still other substances, all bases, that is, capable of uniting with acids to form crystallizable salts, and which, from a chemical stand-point, are probably extremely complex ammoniacal compounds. These different bases do not act upon the organic functions in the same manner; thus the soporific power of narcotine is almost nothing. As

much as two grammes of this substance may be taken without experiencing sensible effects, whilst a single centigramme of morphine, that is to say, a dose two hundred times weaker, acts in a way to produce therapeutic and physiological effects. Thebaïne does not produce sleep, and excites in animals convulsions resembling those of strychnine ; whilst morphine, in a like dose, produces a profound comatose sleep. Another point, not less remarkable in the action of the alkaloids of opium, is that they do not act upon man in the same manner as they do upon animals This is a very interesting fact, revealed by M. Claude Bernard. Thus man is particularly sensible to the action of morphine, whilst thebaïne scarcely acts at all upon his nervous system ; on the contrary, animals feel only a very powerful dose of morphine, whilst thebaïne is for them a violent poison : two grammes of morphine will not kill a dog, while ten centigrammes of thebaïne will take his life with certainty. We may make almost the opposite experiment with man : ten centigrammes of morphine, taken and absorbed rapidly, would probably be mortal, while two grammes of thebaïne would have a less powerful action. In general physiology this difference of resistance to toxic agents is still inexplicable. It is known that belladonna and atropine, which is its active agent, are terrible poisons for man, whilst the rabbit resists them almost entirely. The same dose of atropine that would kill ten strong men would hardly be enough to kill a rabbit. This difference is far from being so marked with morphine ; nevertheless, there is antagonism between its effect on man and animals, acting much more powerfully on the former. If then we confine ourselves to morphine, it proves, for man, the principal and most energetic substance contained in opium, therefore, to describe morphine, is almost to describe the effects of opium; codéine and thebaïne, being much less abundant and active. In fact, in the practice of medicine, morphine and opium are almost indifferently prescribed, therefore they may be included in a common description.

When, in the *malade imaginaire*, it was asked of Argan, dressed up in a bonnet and a robe, why opium put people to sleep, he replied shrewdly : "*Quia habet proprietatem dormitivam.*" "Because it has the sleepy property." Now-a-days we have become more exacting, and, as the reasons of other phenomena have been inquired into, so we endeavor to ascertain the reason of the dormitive property of opium upon the state of the cerebral circulation. It is not certain that the true cause has yet been found ; but is not the fact of the investigation a long advance, and is not doubt the first step in science ?

Everybody knows that in the brain there is an infinity of arteries and veins, and of still more minute vessels called capillaries, which carry to the nerve substance the blood sent from the heart. These vessels are not inert tubes; they have their own proper activity, their autonomy, so to speak, so that at certain moments they dilate, and at other moments they contract. When upon a dog or a rabbit the operation, formerly so common upon man, is performed, called trepanning, the cerebral mass is exposed and seen to be crossed by numerous vessels; but, according to the diameter of these vessels, the aspect of the brain is much different. Sometimes it is flushed, swollen, covered by large vessels, which traverse it in every direction; that is congestion of the brain. Sometimes, on the contrary, it is pale, sunken, contracted upon itself, and it is with difficulty that the minute blood-vessels are distinguished; this is privation of blood, or cerebral anæmia Now, in consequence of special anatomic arrangements, it has been found that the circulation of the eye is the image of the cerebral circulation, so that when the brain is congested the eye is so also, and *vice versa*. It will be readily understood that it is much easier to ascertain if the eye is congested, than to open the brain to see the condition of the cerebral circulation. There is, moreover, an easy method of judging of the state of the vessels of the eye. The circular and contractile opening of the iris, called the pupil, which closes in the light and dilates in the dark, is always contracted when the brain is congested, and always dilated when the brain is anæmic, provided it is not placed in too bright a light, or where the darkness is too profound. It has, therefore, been concluded that, since in normal sleep, as in the sleep by opium, the pupil is contracted, the brain must be congested both in the one and in the other case, and that the sleep is the consequence of the cerebral congestion.

Unfortunately this theory is only an hypothesis, and many facts go to prove that it is not correct. Several English physiologists, among others MM. Durham and Hammond, of New York, have thought that they have proved by numerous experiments, that during sleep there is anæmia of the brain. According to them, it cannot be understood how the afflux of blood to an organ can determine the repose of that organ, and all the physiological functions should be lessened by the slackening of the circulation of the blood, the brain as well as every other of the vascular organs. Thus, in spite of our endeavors, we have not been able yet to judge definitely if opium congests or draws away the blood from the brain, and we know not much more about it than Argan knew, that is, that it puts to sleep.

Nevertheless, this sleep is not the same as the ordinary sleep, differing from it in several respects. About a half hour or an hour after taking opium, a slight excitation is perceived—a general sensation of vivacity and satisfaction, which is soon replaced by a veritable somnolence, and a condition of revery rather than of dreaming. We feel a certain pleasure in giving up to it, and suffer ourselves to be overcome by a sweet torpor ; the ideas become images, which follow each other rapidly, without our wishing to make an effort to change their course While the intoxication is not yet profound, this effort is still possible. We perceive that we are falling asleep, but know that if we wish to shake off its embraces we can triumph over our sleep. Little by little, however, the legs become like lead, the arms fall almost lifeless, the heavy lids can no longer prop themselves open. We dream, we wander, but nevertheless we do not sleep : consciousness of the outer world which surrounds us has not disappeared. Noises from without—the tick of the clock, the rumbling of carriages are obscurely perceived, but it seems as though all these sounds come out of a cloud, and that some other person, and not ourselves, is listening to them. The active *ego,* conscious, willing, no longer exists, and we imagine another individual has come to take its place. Little by little all becomes vague, ideas are lost in a confused mist ; we have become quite immaterial, we do not longer perceive our body ; we are all thought ; this thought goes waltzing around, so to speak, more and more brilliant, but more and more confused. Then the external world disappears, there is no longer any but an internal world, sometimes tumultuous, delirious and exciting a febrile agitation ; sometimes, on the contrary, and most frequently, calm and tranquil, sinking into a delicious slumber. What makes the charm of this sleep is, that we feel that we are sleeping. It is an intelligent sleep—one that understands itself. So the hours pass with marvellous rapidity. In the morning, especially at the hour when the opium would seem to have exhausted its action, whilst in reality it has retained its whole force, sleep has an incomparable charm. The intelligence disenthralled from every earthly bond, seems to reign in a world of tranquil and serene ideas. This is an entirely psychical intoxication, far superior to that of alcohol or hasheesh, for if hasheesh for some hours gives delight, opium gives sleep, and to this there is no benefit comparable.

To appreciate opium at its full value, one must have had insomnia. To hear successively pass all the minutes of the night in the midst of an overwhelming silence; to toss upon the bed, to sketch out ideas

roughly without the power of arresting any one of them, to struggle against an invincible agitation which the struggle does not fail to increase, is a suffering which he who has not experienced cannot understand. Macbeth describes it well when, after he had assassinated Duncan, he was terrified at the insomnia which remorse was causing in him. Said his conscience to him :

> " Sleep no more !
> Macbeth does murder sleep, the innocent sleep;
> Sleep that knits up the ravel'd slave of care,
> The death of each day's life, sore labor's bath,
> Balm of hurt minds, great Nature's second course,
> Chief nourisher in life's feast."

Still it cried to all the house,—

> " Sleep no more !
> Glamis hath murder'd sleep, and therefore Cawdor
> Shall sleep no more; Macbeth shall sleep no more !"

With opium, insomnia is no longer to be dreaded; in an hour or two, at the most, the painful agitation gives way to a confused excitation, which itself becomes this lucid somnolence of which we have spoken. Physical pain no longer exists, the cruel neuralgias, the painful wounds, the spasms or contractions of the muscles, the feverish anxiety of certain general maladies, the moral and physical sufferings of alcoholism, may all be victoriously combatted by opium. If it is true that the office of the physician is especially to combat pain, opium is an all-powerful weapon. How many times has not the science been conquered in the effort to cure ? In the presence of consumption, or of a cancer, what is there to do ? There can be no hope of triumphing over the disease, and but little of even checking its progress; but at least, thanks to opium, we may give to this poor unfortunate who is suffering and must die, calm nights and pleasant sleep, during which his suffering will be forgotten. Therefore medicine, using chloroform for operations and opium for diseases, is so powerful against every kind of pain, that it may almost be said we no longer suffer unless with our own consent.

Thus it is that opium, a poison of the intellect, is also one of the most energetic modifiers of the sensibility. We hardly know if it is through its action upon the nerve that transmits the excitation, or on the brain that perceives it; but, without even procuring sleep, it has the marvelous property of calming the excitability of the nerves, and that diseased increase of their sensibility which physicians have named hyperæsthesia.

It has been remarked that when it calms hyperæsthesia it does not procure sleep, so that it seems to exhaust its power against the pain and reserves none to give repose.

Among those who suffer with rebellious neuralgias, opium eases their sufferings, and to procure sleep a stronger dose must be administered. Yet it is not enough to have calmed the irritability of a diseased nerve? There are individuals who are not able afterward to drop the habit, and they come at last to take it in formidable quantities without any perceptible action. In fact, opium is greatly different in this respect from alcohol. Alcohol accumulates its effects; the more habituated we become to drinking the sooner drunkenness comes on. We do not become habituated to the intoxication of wine, but we do to that of opium, and thus it is that unfortunates are seen who abuse this substance to such a degree that they drink every day as much as a litre (nearly two pints) of that laudanum of which twenty drops is a sufficient medicinal dose.

When one has reached this degree of intoxication, opium has become a necessary stimulant; we can no longer do without it, and are as sick through the absence of laudanum as by an excess of it. I have seen patients who have had sub-cutaneous injections of morphine every day who have come to require daily doses of a gramme (15 grains) of this substance. If by chance the dose has been diminished, or, still worse, if it has been omitted altogether, they are seized with serious symptoms, which are easily referred to their true cause, the absence of the stimulant which their organism has come to demand.

In China opium has become one of the necessities of the population, as in Europe alcohol and tobacco. The consumption of opium dates back not a great ways, and is, perhaps, the sole innovation China has accepted from the West; they are not to be congratulated upon it. Neither should we congratulate the English who seek by every means to propagate a habit which to them is as lucrative as it is fatal to the Chinese. Here are some figures showing the constant progress made by the opium trade: In 1798, 300 tons of 2,240 lbs; in 1863, 3,000 tons; in 1866, 3,903 tons, and in the last ten years the consumption has grown in still larger proportions. All this opium comes from India, and the government officers, as well as the tradesmen of India, realize greater and greater profits in proportion as the use of opium is extended.

There are eaters of opium, but smokers are most common. The extract of opium is placed in a pipe with a long stem; on lighting it the opium swells up and adheres to the bowl of the pipe, and at every mo-

ment it is necessary to pass a wire into the stem to permit the passage of air ; moreover, as opium does not burn easily it is necessary to keep a lighted flame at hand, a taper or a lamp, which keeps the pipe from going out.

The number of smokers of opium is considerable, but those who abuse it are far from being the most numerous The richest mandarins, the most intelligent merchants smoke opium as do the dregs of the cooleys ; the pleasure is analogous to that of tobacco with us, and is not much more injurious, at least among the higher classes ; but among the people it is not so. There are establishments especially consecrated to opium, a sort of smoking shops, where, upon payment of a small sum, this passion can be satisfied. It is rare that a smoker departs till he is completely intoxicated, just as an habitual drunkard does not quit the wine-shop till he is entirely overcome with drink. Certainly, taken in this manner, opium is a dangerous poison, and as all travelers tell us, those who daily take an excess of it soon fall into a terrific moral and physical degradation Pale, sallow, emaciated, dragging themselves along with difficulty, they have no life nor energy till a fresh dose of the poison gives them a factitious stimulation. Nevertheless, it is very probable that the deadly effects of opium have been exaggerated ; the number of those who die of this abuse is very small ; many smokers of opium and even those who smoke it in considerable quantities, preserve the integrity of their intellectual faculties. It is true that the digestive functions rarely remain intact. Dyspepsia and a general wasting of the flesh are consequences of this injurious habit ; but, however this may be, China is not yet at the point of death, and if she is in decay opium cannot be accused of causing it.

Opium has an antidote, and just as the one has the property of causing sleep so does the other give sleeplessness, and is another intellectual poison whose effects are diametrically opposed to the former ; I refer to coffee. Coffee has risen into notice very rapidly, for it is scarce a hundred years since it was almost wholly unknown ; therefore, as all *parvenus*, it has its detractors and its partisans ; but its partisans gain the victory, for there is hardly any drink whose use is wider spread.

There is no one who has not been able to judge the effects of coffee ; to certain persons it gives a necessary excitation for their intellectual work. With others this excitation results in a cruel insomnia, so that for them coffee is a veritable poison which deprives them of the most precious of gifts. However small a dose these take it brings on most

painful agitation and anxiety, a sort of feverish activity, entirely different from the indolent activity of opium, in which the will seems asleep and to be peaceably looking on at the frolics of the imagination. With coffee the imagination is scarcely affected, but on the contrary, the will is. We wish to move quickly; we cannot finish peaceably the reading we have undertaken; neither can we keep still. If I were not afraid of seeming to yield to the pleasure of justifying a theory, I should say that the voluntary and conscious faculties seemed super-excited; there is, as it were, a constant effort of the attention and the memory, while with alcohol, hasheesh and opium there appears to be a drowsiness of the attention. Coffee, therefore, produces an intoxication that is much more fatiguing than the somnolent drunkenness of opium, but it leads to the same result. In seeking to accomplish too much the intelligence does less; by force of its excitement the will destroys itself, and this perfect balance of the intellectual faculties is broken as well by the excess as by the absence of will.

In a general way it may be said that coffee produces anæmia of the brain, whilst alcohol and opium cause the congestion of that organ; but this physiological theory is far from being founded on indisputable bases, and new observations are necessary. Nevertheless, the office of coffee in the general nutrition is known quite accurately; it slows the organic combustions, so that it has been justly called an aliment of *economy*. In fact, in the normal state, there goes on in the interior of our tissues an infinity of chemical actions whose final result is the production of warmth, and the setting free of carbonic acid. This carbonic acid passes into the venous blood, and the venous blood reaching the lungs unloads all the carbonic acid it contains. The quantity of carbonic acid given off is then, up to a certain point, the expression of nutritive activity. Now, with coffee, without the diminution of strength and without the necessity of breathing more oxygen or of consuming more food, the carbonic acid diminishes, and the strength does not appear to be lessened. In this relation the case of the Belgian miners is always cited, who are able to do much work almost without food, sustained solely by the absorption of great quantities of coffee. It is then an aliment which moderates nutrition, since it diminishes the activity of the incessant chemical renewals that take place in the interior of our tissues. Other substances may be cited analogous to coffee in this respect; notably tea and coca. It is probable that caféine, théine, and cocaïne, which are the active principles of these aliments, have a chemical as

well as a physiological analogy with one another, and that their effects upon the intellectual functions are almost identical.

Perhaps there are other poisons of the intellect, especially belladonna and tobacco, but the active principles contained in these plants, atropine and nicotine, act chiefly on the muscular fibre, and their action upon the cerebral functions seems to be consecutive to that which they exert upon the functions of the spinal cord.

After having separately studied the action of alcohol, of chloroform, of hasheesh, of opium, and of coffee, a résumé of the disturbances produced by these substances upon the intellectual functions is easy. Just as the study of the functional troubles of the spinal cord, under the influence of strychnine, of bromide of potassium, or of atropine, gives us precious information upon the normal functions of this organ, so the analysis of the functional disturbances of the intelligence, poisoned by substances which pervert it, may furnish us with incontestable notions upon its mechanism when in a state of health.

The essential fact, and the one we have endeavored to bring into full light, is that the intelligence is always altered in the same direction. The voluntary and conscious faculties become paralyzed, the imaginative and conceptive are exalted. Thence a certain duality in the *ego*. It is that which conceives and that which directs the ideas. When the direction is wanting disorders in the conception are inevitable, and illusions, hallucinations are the necessary consequences; there is, indeed, a certain balance in the intellectual forces which it is not well to derange. As soon as this harmony no longer exists, the man is given over without restraint to a disordered cerebral activity, which permits neither labor, nor moderation, nor reflection, and which makes of him not a brute beast, as has been wrongfully said, but a maniac and a fool.

Language, which is the most perfect expression of the experiences and observations of many ages, says "Wine disturbs reason." This is because the reason is not the imagination. To have reason is to be in full possession of one's self, to rectify the conceptions by the external sensations and to judge accurately. This *I* that judges, rectifies and directs, is the will; it is also the attention. This will is not a fantastic being, nor a form of speech; it is something real, active and powerful. It is the result of anterior habitudes, of hereditary forces accumulated through a long series of ancestors, and of sensations picked up on every side during many years. It is an indisputable power; it forces ideas to fol-

low a constant direction; it eliminates at its pleasure impressions from without, and gives to the conceptions a determinate direction, of which it is the master. Nevertheless, there pass in the brain an infinity of acts of which we have no consciousness, and which, thanks to it, pass unperceived, and do not arise to trouble us. Just as, in a crowd of men passing around us, there is one whom we follow with our eyes, whom we pick out from the throng, to whom we speak, who replies to us, without our noticing the others who are around; so, in the crowd of our thoughts, there is one which we select, which we dwell upon, which we study with perseverance, without the other thoughts murmuring indistinctly around this one turning our attention from it and causing us to forget the end we are pursuing.

Behold the grandeur of the human intellect. It not only conceives, and conceives more richly than all other intellects, but it is mistress and sovereign of itself. When, by a toxic substance, this faculty of reflection and will is altered the intellect is altered also, in what it has of most lofty and most powerful. We may perhaps be tempted to believe that, for works of imagination, the excitement of the conceptions is salutary, and to say that certain men produce only under such conditions; but this will be a fatal error. We lose too much in losing the power of directing our thoughts, while by the effort of a strong will, made still stronger by the habit of labor and reflection, we reach a result surer and as brilliant. We never know fully what power the attention has nor all that the will can give us. To will is power. The attention concentrated upon a thought renders it so brilliant that it may, under some circumstances and with some persons, cause it to appear under an imaginative form with as much of splendor as if the intelligence had been over-excited by alcohol or opium. Therefore drunkenness has not those compensations which we strive to find therein. It is an evil without advantages, and the abuse of these terrible poisons, which destroy both body and mind, should be vigorously combatted by all who are interested in the future of humanity.

But man is neither angel nor brute. He should preserve his will intact and not drown it by poisons; he should also respect and cultivate these unconscious, almost instinctive faculties which make up another part of him. Given over to reason alone, he would be but an imperfect being, a sort of ridiculous egoïst, isolated in creation and humanity. The clean sweep which the stoics have sought to make of the human passions is a work not only chimerical, but one which, if it were possible, would be as fatal as the loss of reason. The sentiments,

the passions, all these spontaneous movements of the soul, all these brilliant conceptive faculties which lie asleep in some corner of our intellect, and are awakened by the will, are not defects in the human organization. Nature has bestowed them upon us, and far from accepting them grudgingly, we should be proud of them, should develop and increase them. Perfect intelligence is the balance between will and passion. We should not smother one for the sake of the other; both should be respected, both should be strengthened by habit and reflection, in order to transmit to our children the progress we have made upon ourselves.

DENTAL ANATOMY AND PHYSIOLOGY.

BY THOMAS GADDES, L.D.S., R.C.S.

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MR. DEAN AND GENTLEMEN—Our subject is titled The Synthetic Study of Odontology. Let me at the outset explain what is meant by synthetic study. Synthesis is the putting together of the elements of thought into a whole; and in this respect it is the opposite of analysis, which is the resolving a whole into its elements. The examination of the elements of a subject; the arranging and bringing together of those various elements; would constitute the synthetic study of that subject.

Now, it is shown by one of the most able scientists of the present day that "science is that which treats of the forms in which phenomena are known to us, and of the phenomena themselves, in their elements and in their totalities." Moreover, to treat any subject to the best scientific advantage is to consider it in its elements, and then in the aggregation of those elements. I shall not enlarge upon the advantages thus to be gained, for on a little thought some of the benefits will be evident to most of you.

I have thought it well, in considering with you the subject of Dental Anatomy and Physiology, to study it synthetically; an arrangement of the subject you will not find in books, though you may find therein most of the facts I shall have to dwell upon. Therefore, I ask you to take full and perfect notes of what I say, and afterwards to work those out with the aid of books.

The subject demands your closest attention. Among the *special* subjects of the Dental Curriculum, this is the most difficult, while, at the same time, it is the basis of all your special dental education. In delivering the lectures it will be my constant aim not only to make them as attractive as I can, but also to make each subject as plain as possible by sketches and demonstrations

Those of you who attended my summer course of lectures on Histology will be somewhat familiar with many expressions, and also with the forms of development as seen to occur in some of the tissues ; therefore, I shall here only allude to them.

The animals lowest in the scale of organization (class *Gregarinida*, sub-kingdom *Radiata*) are devoid of mouths and of digestive apparatus. They live entirely by imbibition.

In the next class (*Rhizopoda*) are animals which possess the power of throwing out processes of their substance, as white blood corpuscles do, exhibiting a distinct amœboid movement. These processes are called "pseudopodia." By means of these becoming attached to, and encircling, nutritive particles, and thus drawing them into its substance, does the animal perform the function of indigestion or feeding. There is neither mouth nor anus: indeed there is nothing to be discovered by the microscope worthy of the name of organization. In the substance of many of these creatures nothing is to be discerned but a mass of jelly-like texture, resembling a particle of thin glue.

Ascending the scale we find animals (class *Hydrozoa*) exhibiting a definite histological structure of their tissues, possessing a mouth and digestive cavity. This digestive sac, according to Prof. Huxley, is not in any way included in the substance of the rest of the body, but stands out independently, so that the outer wall is in direct contact with the water in which the animal lives. A Hydrozoon is essentially an open-mouthed saccule, consisting of two membranes—an ectoderm and an endoderm. The majority of these animals seize their prey by means of tentacula, which are processes of these membranes, developed either around the mouth, or from the walls of the digestive cavity.

In another group of animals of greater complexity than the former (class *Polyzoa*)—sea-mats, &c.—the mouth is surrounded by a circle of tentacles, and every tentacle is fringed with long and active vibratile cilia, lashing water towards the mouth. The mouth leads into a long and wide pharyngeal and œsophageal tube, which opens below into a definite

stomach. From this is continued a distinct intestine, which bends upon itself towards the oral end of the body, and then terminates upon the outer surface near the mouth. In this group we have for the first time in the survey of the animal kingdom, an animal possessing a complete intestine.

In certain of the class *Crustacea* (sub-kingdom *Articulata*)—notably the crab and lobster—some of the limbs are modified so as to form maxillæ and maxillæpeds, the animal, so to speak, masticating with it's legs. These are parts of the exoskeleton. In the lobster one pair of maxillæ are finely dentated, giving the appearance of teeth; the other maxillæ have large tubercles upon them, but analogous to the fine dentations of the other pair of jaws.

Ascending to the sub-kingdom *Molusca*, in the class *Branchiogasteropoda*—which contains the whelks, periwinkles, sea-slugs—and also in the *Pleurogasteropoda*—snails, slugs, &c.—the cavity of the mouth is invariably provided with an organ denominated the odontophore. It consists essentially of a cartilaginous cushion, supporting, as on a pully, an elastic strap, which bears a long series of transversely disposed teeth. The ends of the strap are connected with muscles attached to the upper and lower surface of the posterior extremity of the cartilaginous cushion; and these muscles, by their alternate contractions, cause the toothed strap to work backwards and forwards over the pulley formed by its anterior end. The toothed strap consequently acts like a chain saw upon any substance to which it is applied, and the resulting wear and tear of its anterior teeth is made good by the incessant development of new teeth in the secreting sac, in which the posterior extremity of the odontophore is lodged.

In certain other molusca there is a differentiation of the mucous membrane of part of the alimentary canal to the extent of producing from this membrane bony plates and even teeth, as in the odontophore of whelks, snails, slugs, &c.

Now, if we pass from the primary division Invertebrata, of which I have given examples, to the Vertebrata, we shall therein find the differentiation of tissues for dental purposes of much higher types of complexity as regards form, structure and distribution.

When an invertebrate animal possesses organs of mastication, these are either productions of the alimentary mucous membrane, or are modified limbs. In no vertebrate animal, on the other hand, are limbs so modified and functionally applied, the jaws being always parts of the cephalic parietes, specially metamorphosed, and totally distinct in their nature from the limbs.

If we consider the teeth of the lowest class of vertebrata—fishes—we shall find, not only as regards substance, but as to their number, form, structure, situation, and mode of attachment, that they present more various and striking modifications than do the teeth of any other class of animals.

Commencing with the lowest genera, I shall first allude to those included in the order *Marsipobranchii*, such as the lampreys, and hag-fish. These animals have no mandible or lower jaw (Huxley), and are destitute of true calcified or dentinal teeth, the armature of the mouth consisting of horny cones or serrated plates. The labial opening of the mouth of the lamprey is like the concavity of a cone, and is covered with converging rows of teeth. The palatal cartilage carries a tooth which is generally bicuspid, and this is opposed by a semi-lunar horny plate, with which the cartilage, representing the lower jaw (Owen), is sheathed. There are also lingual horny plates. In the hag-fish, which is of parasitic habits—living upon the bodies of other fish—there is a single tooth in the median line of the palate, and a double serrated horny plate on each side of the upper surface of the tongue.

Passing to the higher order of fish (*Elasmobranchii*), the notochord, or embryonic structure which represents the vertebral column, is not persistent or undivided as in the two lowest orders (*Pharyngobranchii* and *Marispobranchii*), but it is generally separated into vertebræ more or less distinct. The vertebræ and other bones are "cartilaginous" in the interior, having an osseous crust only. There is a lower jaw. Here we have the sharks and rays as examples. In the still more highly differentiated or osseous fishes, there are more or less complete bony vertebræ; and in the different species of the class there are great varieties and modifications of dental structures.

In birds we observe the mouth adapted in the best possible manner imaginable for rapidly picking up small grains of food. To avoid their enemies they must necessarily take up that food so quickly that time for mastication is not permitted. As a result of the quantity habitually taken there has been produced a dilatation of the upper part of the alimentary canal, this dilated portion being called the "crop." Thus, the food being rough and unmasticated, the mucous membrane and the muscular walls of the alimentary canal are thereby subjected to different influences or forces than they would be if such food were less hard, or more masticated. These forces—viz., the action of rough and unmasticated food—necessarily lead to such a differentiation of the mu-

cous membrane, and of the muscular walls as fit that part for triturating the food, producing upon the mucous coat a ridged and tuberculated layer of horny matter, and an excessive development of the muscular tunic. These conditions we find in the gizzards of birds. And it is observed that the gizzard of a granivorous bird is more highly differentiated in those directions than is the gizzard of a carnivorous or flesh-eating bird. Thus in birds, having no masticating apparatus, the internal functions are specialized, and the crop serves as a reservoir and macerating sac, while the gizzard serves as a chamber to triturate. Hunter habituated a sea-gull to feed upon grain, and found that the lining of its gizzard became hardened, while the gizzard muscles doubled in thickness.

All known extant birds are devoid of teeth ; but a few fossil specimens prove that there have existed birds with these organs. Some of these have true teeth, with curved crowns and thick roots, which are lodged in a groove. Another specimen (*Ichthyornisdispar*) possesses true teeth—$\frac{4}{4}\frac{0}{0}$—lodged in distinct sockets. But, apart from fossils, Geoffrey St. Hilaire discovered in a fœtus of a paroquet nearly ready for hatching that the margins of the bill were beset with white and round tubercles, and under each tubercle there was a gelatinous pulp, supplied with vessels and nerves like that of a tooth. These are very important facts, inasmuch as they serve to link birds with reptiles, thus showing their true place in the animal kingdom, and supplying such data as the study of evolution teaches us to expect.

In reptiles and mammals we also find great variety in the teeth. In some instances the structure is comparatively simple, while in others it is very complex. We shall see, by-and-by, what forces or agencies are to be considered as causes in producing these modifications ; but what I desire you now to observe from the foregoing, is that in the vertebrata all teeth are alike developed from a part of the mucous membrane of the alimentary canal. Whether the structure of the dental tissue be comparatively simple or complex ; whether it resemble the ordinary structure of the bone of the animal, or of a lamination of hardened scales ; or whether it be of a distinct and special structure, as true dentine or enamel ; the tooth tissue is homologous with the mucous membrane. By homology is meant that relation between parts which results from their development from corresponding embryonic parts—almost a similarity of origin. This relation of the teeth to the mucous membrane is termed general homology, and the relation of one tooth to another (as a canine to a pre-molar) is serial homology. To illustrate the terms in another way :—Flowers of plants

are modified leaves, they are both developed from the same embryonic structures, and therefore the one is the general homologue of the other. And again, the different parts of a flower—as the petals, the stamens, the pistil—are instances of serial homology.

Let me here explain to you another term you will frequently meet with —morphology. Morphology is the law of form or structure, and is said to be the very soul of natural history.

I here represent, in a tabular form, as well as I have been able to think out, the relations between these several branches of concrete science springing out of biology. The table also gives a definition of each science, though necessarily of an abstract form.

(*See Table, opposite page*).

Teeth, then, are modified or differentiated mucous membrane, a consequence of a further integration of matter by that tissue. They are the general homologues of mucous membrane—a result of morphological and physiological development.

Such would be an explanation of the genesis of teeth according to the principles of evolution. For an explanation of the genesis of teeth, of the multiplicity in number, form, and structure of teeth ; as well as for the genesis of organisms, the multiplicity of parts, and the complexity of those parts in organic aggregates—in short, for an explanation of the differences between organisms—there are two main hypothesis. First, that the different and various forms were created by a direct and special interposition of the Creator ; secondly, that such organic phenomena were produced by the agency of the environment, that is, by physical forces, working upon susceptible matter during time, of which we have no conception.

The first theory has, by Professor Huxley, been termed the Miltonic ; the second is that of Evolution. To the first theory advanced science and advanced thought raise questions, and bring forth facts which the theory, in its integrity, cannot answer. Those questions and other phenomena receive an answer and an explanation by the hypotheses of the the theory of evolution. Consonant with the theory of evolution, the conception of "the constancy of the order of nature has become the dominant idea of modern thought. * * * Though we are clear about the constancy of the order of nature at the present time, and in the present state of things, it by no means necessarily follows that we are justified in expanding this generalization into the infinite past, and denying absolutely that there may have been a time when nature did not fol-

Table Showing the Relations, and Giving a Definition of Several Branches of Biology.

- **Organic phenomena (*Biology*)**
  - **of form of structure (*Morphology*) which may be**
    - **Special**
      - as they apply to tissues and anatomical elements (*Histology*).
      - as they apply to apparatuses, systems, organs (*Anatomy*).
    - **General** — as they apply to embryonic beings (*Embryology*): And the relation between parts which are developed from the same or corresponding embryonic structures (*Homology*) may be
      - *General* (*Homology*), — as with parts distinct from one another:— Flowers with leaves, teeth with mucous membrane.
      - *Serial* (*Homology*), — as with parts of an apparatus to each other in the same being:— Parts of a flower to each other, teeth to teeth.
  - **of function**
    - in their internal relations (*Physiology*)
    - in their external relations (*Psychology*)

low a fixed order, when the relations of cause and effect were not definite, and when extra-natural agencies interfered with the general course of nature." Here, I pray you, mark a refutation of a popular delusion. As I interpret evolution in its deepest and most comprehensive significance, it does not ignore a Creator; yea, it presents at bottom, and on many sides, a fundamental, an incomprehensible, and unknowable, a great mystery—God.

Now, to make clearer to you, and to investigate the causes of the mucous membrane becoming so differentiated, let me point out some of the factors in the process of evolution—or integration of matter and disintegration of motion.

In the review of the invertebrate animals we saw that in the lowest there was no alimentary canal or mouth. Then by a pouching of the external surface we had formed an alimentary sac with but one aperture, and this sac was external to the body. When we advanced up the scale of animated beings we found that this sac was elongated and recurved, having an inlet and an outlet, thus forming a complete intestine. In crustaceans we saw that the exoskeleton, or hard outer shell, was modified into maxillæ and maxillæpeds, and that these, also in common with other parts of the surface, were covered with tuberosities, giving a dentate or toothed appearance to the jaws. Higher in the scale we found the mouth armed with an odontofore or toothed strap. Then we came to that great sub-kingdom vertebrata, where the hardened framework of the body was internal and covered with layers of muscles, skin, etc. And as we ascend in the scale of organization, we find an increasing differentiation of tissue, first upon the surface, and gradually toward the interior, in a similar manner as we observe the formation of a denser envelope or cell wall upon the periphery of an elementary cell. In a similar manner also, and by the same causes, is produced that differentiation of tissue which we recognize as bone, cementum, dentine, and its varieties, Now, to discuss the causes which have produced the complexity of all organisms, such as the various tissues, their shapes and functions, would be to discuss evolution. This is not the time for such discussion, but to carry out the programme I have laid out, I must necessarily allude to those causes as briefly and as clearly as I possibly can.

Suppose a mass of homogeneous, structureless organic matter termed protoplasm or bioplasm, and you mentally represent roughly an analogue of a primordial utricle, or, if you please, first created organic mass. The

characteristic of such a mass is constant susceptibility to change in the form of integration of matter, or of disintegration of matter; such characteristic being expressed by the "instability of the homogeneous." The homogeneous becomes less homogeneous; or, the homogeneous becomes heterogeneous; or, in other words, the simple progresses toward the more complex. The simplest organic matter possesses this characteristic property. By its working slight differences are produced, and by the slow accumulation of modifications upon modifications, and by slow divergences resulting from the continual addition of differences to differences, are produced all organic forms. To reduce this to a practical expression, it can be said that the differences between one animal and another, are due to additions and suppressions of parts. Now, in seeking for the causes of such differences between animals, we are led to the causes of this instability of the homogeneous; and here we find the key to organic evolution.

In my introductory lecture to the course on Histology,* I alluded to the physical forces, and spoke of the correlation of the physical forces, of their metamorphosis or interchangeability. To give a simple illustration of the fluctuation of physical forces, consider for a moment, night and day, Winter and Summer, how these changes visibly affect plants and animals; how in the daylight plants break up carbonic acid, fixing the carbon in their tissues, and liberating the oxygen; how, by the influence of sun heat, evaporation of moisture from their leaves aids the upward circulation of fluid, thus affecting the parts so acted upon; how animals store up energy during sleep, and discharge a greater amount during waking hours. Such, then, briefly, are daily and yearly fluctuations of the forces surrounding us, as taught according to meteorology. Then, again, by examining the formation of the crust of the earth, we find various strata of very different kinds of material, which must have been formed at different ages and under very different external or surrounding conditions. So here, geology teaches a fluctuation of physical forces extending through ages. Astronomy also yields further evidence of this variation through astronomic periods. Now, these changes in the inorganic forces which influence the medium or environment of organisms, affect not only visibly, as we have seen, but also invisibly, the instable homogeneous matter of which organisms are composed. In the changes of the physical forces, ever in progress, are to be found the inorganic

*Vide page 9.

factors, to which all organisms are exposed, in the process of evolution. These *external* factors can be grouped as astronomic, geologic, meteorologic and organic. As *internal* factors in the process of evolution are the several agencies grouped as "natural selection."

By the actions of those external factors, and of those internal factors, upon unstable homogeneous matter—*i. e.*, matter ready for change—are differences produced Difference is added to difference, and the result produced is that degree or accumulation of differences termed variety. Variety is simply a less definite expression of species; and species a less definite and more special expression of genus; and so on, genus of order; order of class; class of sub-kingdom; sub-kingdom of kingdom.

These are expressions of a classification of different groups of organic phenomena, it may be in their extremes broadly contrasted from one another, but shading off one into another. "Evolution being a universal process, one and continuous throughout all forms of existence, there can be no break, no change from one group of concrete phenomena to another, without a bridge of intermediate phenomena."

In short, by the same agencies which produce differences, by the same mental process through which we pass to establish or mentally represent those differences; by precisely the same agencies acting through time, and by precisely the same mental process carried farther, do we necessarily and inevitably arrive at the conclusion that varieties and species are so produced—that species are mutable. Admit the mutability of species, and by the same mental process do we necessarily admit evolution as applied to the animal kingdom, to the vegetable kingdom—to the organic world.

To give a general expression to the causes of evolution: the forces acting upon organisms are multiform, and ever undergoing slow variations and complications; the organic units are extremely unstable, and the slightest variation in their conditions destroys their equilibrium, and causes them either to assume altered structures, or to decompose; that the multiplication of effects conspires with the instability of the homogeneous to work an increasing multiformity of structure in organisms.

Such is a brief, a too brief, exposition of organic evolutions.

To apply these general conclusions to the differentiation of tissues, and to show, though it may be in a hypothetical manner, the process of evolution in the production of some specialized tissues, I shall give the following illustration of the development of the vertebral column, the great axis of the higher animals. Let us begin with the simplest type of a ver-

tebrate animal. The fish has a mode of locomotion which involves alternating transverse strains ; along with this ever-recurring and alternating transverse strain is there a resistance to the strain, brought about by the different degrees of the incident forces of tension and compression. The same forces acting upon an aggregate of homogeneous organic matter would lead to the development of the notochord, or the rudimentary structure which eventually becomes the vertebral column, not only of the fish, but of all vertebrate animals. In the amphioxus—the vertebral column is represented by a jelly-like cord, on which the divisions of the vertebræ are simply indicated by very slight markings. The notochord in a more advanced stage is cartilaginous, and of one continuous piece. Later it becomes segmented, segmentation beginning at the surface. Also first upon the surface it becomes calcified, while the interior remains cartilaginous : such is the condition of the skeleton of cartilaginous fishes. Higher in the scale there is perfect ossification of each segment, and complete bony vertebræ. These are phenomena which, generally speaking, are to be observed even in the human embryo. The human vertebral column. from its embryonic condition to its adult form, passes through all these phases. Thus by actions and reactions of forces, which are ever and even now going on, are definable possible causes of those rudimentary or primitive structures which the simplest vertebrate animals present. Let me make these phenomena more clear to you. That compression produces hardening. We have the fact readily observable by all, that even within certain areas of the hands and soles of the feet on which pressure is habitually greatest, there the skin is thickest ; and in each person special points exposed to special pressures becomes specially dense, often as dense as horn ; witness a similar thing in persons who use their edentulous gums in attrition, and those whose gums are shielded by artificial plates.

So, then, by the action and reaction of forces upon the instable homogeneous is heterogenity or difference produced. Difference is added to difference according to the laws of morphological or structural development. As we saw with regard to the hands and feet, how use produced difference or thickening of the parts, so use or functions still further aids the production of differences according to the laws of physiological development. It will also be apparent that the being most differentiated, most fitted to its environment, will have the best chance of surviving its competitors, and of propagating its kind ; and also the correlative, that the less differentiated, or less fitted to the environment, will succumb :

So, also, is there in all cases a progressive adaptation, and a survival of the most adapted.

To the phenomena grouped in and expressed by evolution—"or the integration of matter and dis-integration of motion, a necessary antecedent to the differentiation of matter so integrated"—I say, by evolution only can a scientific explanation be given of the complexity of organisms; this necessarily including differences of structure and function of tissues, of structure and function of animals. Remembering what I a little while ago impressed upon you, that in the vertebrata all teeth are developed from a part of the mucous membrane of the alimentary canal, and that they consequently are generally homologous with the mucous membrane; remembering this, and by the application of the factors of evolution will the differentiation of that tissue for dental purposes be comprehensible. In other words, with time and evolution are symbolically comprehensible the production, in successive generations, of such specialized tissues for dental purposes as horn, bone, cementum, osteo-dentine, vaso-dentine, plici-dentine, true dentine and enamel.

The morphological or structural relations of those tissues I shall proceed to consider in my next lecture.—*From the Monthly Review of Dental Surgery.*

LARGE CARTILAGINOUS TUMOR OF THE LOWER MAXILLA; REMOVAL WITH HALF OF THE JAW.

By George Lawson, F.R.C.S.

Surgeon to the Middlesex Hospital, and to the Royal London Opthalmic Hospital, Moorefields.

The following case of tumor of the lower jaw, which has been under my care at the Establishment for Invalid Ladies, is one of special interest, first from its large size, its position, and the peculiar structure of its growth; and, secondly, from the lady having been the last patient upon whom the late Sir William Fergusson operated in private.

The history of the case goes back to 1865, when she first came under Sir William Fergusson's care on account of a large tumor, bulging below

the jaw, and pushing into the mouth. He then removed the tumor, and at the same time took away five teeth from the lower maxilla, which appear to have been displaced by it. Unfortunately the patient had kept no account of the dates of the different operations she had undergone. She was only able to say that she was operated on twice between the years 1865 and 1872, and three times between 1872 and 1876 ; the last operation being in November, 1876, when Sir William apparently succeeded in getting away the whole of the growth

On December 26th, 1877, the patient, aged fifty-seven, a stout healthy-looking woman, was admitted into the Establishment for Invalid Ladies for the purpose of having the tumor again removed. On admission, the tumor extended upwards to the level of the lower part of the ear, downwards in the neck to within two fingers's-breadth of the clavicle, and forwards it was bulging close up to the nose. Looking within the mouth, the tumor was seen to occupy the greater portion of that cavity ; and it extended across the pharynx, against which and the soft palate it pressed. The mouth could be closed, and she could take food without much difficulty, but her breathing was at times troublesome, and especially at night. Sir James Paget and Mr. Bowman kindly saw the patient with me, and both agreed in advising an operation.

On Jan. 7th, 1878, the patient having been placed under chloroform by Mr. Stewart, I proceeded to remove the tumor, assisted by Sir James Paget, Mr. Clark, and Mr. Stewart, jun. The mouth being opened and fixed by a gag, a ligature was passed through the tongue and handed over to Mr. Stewart, jun., who kept the tongue well drawn forwards during the whole of the operation. An incision was then made from the lower border of the ear around the greater circumference of the tumor to the centre of the lower lip, which was divided. The flap of skin was raised from the tumor and thrown across the face ; the lower part of the tumor was then freed from its connexion with the neck, and the lower jaw sawn through with a chain saw at the symphysis. I again divided the jaw a little below the coronoid process, as I felt it would be safer to disarticulate after the bulk of the tumor was removed, for if the internal maxillary artery were torn during the disarticulation, I could then secure it more readily. Finding that the tumor was firmly wedged above the soft palate, I cut through the upper portion of it, and then, without much difficulty, removed the great mass. I afterwards disarticulated the portion of the jaw which was left, and took away the remainder of the tumor. The only vessel which bled severely was the internal maxillary,

and this was easily secured. The flap of skin was then replaced and kept in position with harelip pins at the mouth and sutures in the other portion. A fold of lint wet with a lotion of carbolic acid, of the strength of 1 to 100, was then laid over the wound and held *in situ* with a few turns of the bandage. The patient was placed in bed with the head well raised, and the ligature in the tongue was left to enable the nurse to draw the tongue forward if it should by chance slip backwards and cause any difficulty in breathing. Towards evening a subcutaneous injection of morphia was given.

Jan. 8th—The patient passed a fair night, sleeping at intervals. Pulse 112 ; temperature 102°. The ligature in the tongue was removed. During the night an enema of beef-tea, egg, and brandy, was given, but it was only partially retained ; and this was again administered in the morning. During the afternoon the patient was able to swallow a little milk, and from this time she took fluid nourishment by the mouth.

9th.—Progressing favorably.

From this date the patient continued to do well. A small portion of the edge of the flap sloughed, but the rest of the wound united throughout the greater part of its extent by primary union.

On the 20th of January (thirteen days after the operation) she was able to get up, and she left the home on Feb. 14th. The wound was then completely closed, with the exception of one small spot near the lower border.

Examination of the tumor.—The tumor weighed close upon eighteen ounces. It was of a firm consistence, but easily cut with the knife. It was intimately connected with the periosteum on the inner side of the lower jaw, from which it apparently sprang. A portion of the tumor was given to Dr. Thin immediately after its removal, who kindly gave me the following report of his microscopical examination :—"I examined microscopically the portion of the tumor kindly given me by Mr. Lawson, and I believe the growth to be a chondrome of the class named by Cornil and Ranvier chondromes hyalins lobulés. It has the peculiarity that the cartilaginous tissue is of a very low type, so much so that the determination of the exact nature of the growth was a matter of some difficulty. Successful preparations, however, show, that, except in the degree of development of the cartilaginous substance proper, the structure is identical with that described by pathologists as characteristic of these tumors."—*The Lancet.*

THE BROOKLYN DENTAL SOCIETY, REGULAR MONTHLY MEETING, FEB. 11, 1878.

Incidents of Office Practice.

Dr. Mills : I have an interesting case to speak of, not an uncommon one, yet young men may profit by what I have to say of it. It is one of incipient periostitis. A gentlemen came to my office two weeks ago last Sunday, with the inferior right second bicuspid, which had pained him intensely several hours. I found the tooth a little tender upon pressure. The mechanical method I applied for partial relief is not original. I first heard of it from Dr. Wm. B. Hurd, at a meeting of the Old Brooklyn Dental Association. I have used it so often, and with such great satisfaction to myself and patients, I feel like speaking of it. I softened a piece of gutta percha and formed a cap on the opposite bicuspids, removed and chilled in ice water, and replaced it on the tooth. This cap is for the purpose of relieving mechanical pressure upon the diseased tooth. I then took an excavator for the purpose of opening to the pulp through the cavity of decay located on the posterior proximal side ; grasping the tooth carefully with thumb and finger (for the pulp was red-hot with pain), worked carefully to the pulp and bled it. The pain was increased for the moment, but was soon much relieved. I gave 20 drops of wine of opium, and dismissed him. I have applied these remedies in a great many cases in the last ten or twelve years, and they have never failed to give relief.

Dr. Brockway : What would be the treatment when the pulp is dead?

Dr. Mills : I would use the cap, open into the pulp cavity, and give the wine of opium.

Dr. Cook : I have a case of a tooth fractured through the center and far down the root—the second left superior bicuspid. The gentleman, 65 or 70 years of age. The tooth was slightly worn, not decayed at all. The buccal root was fractured at the same time. It was fractured in the ordinary way of taking food, and nothing specially hard.

Dr. Mills : Dr. Jarvie has asked me a question in regard to the wine of opium. I do not wish to be understood that the 20 drops given is a maximum or minimum dose. Make the dose according to the age and circumstances. The books give the average instruction, but the intensity of the pain might necessitate a larger than the average dose. I have

used the wine of opium for twelve years or more, and have found it to control the nervous current very successfully indeed.

Dr. JARVIE : I would like to ask if the dose is repeated, or if one dose is usually found to be enough ?

Dr. MILLS : I would repeat it in many cases. I gave this young man 20 drops—the pain was very severe.

Dr. HILL : Does it create nausea ?

Dr. MILLS : No, sir.

Dr. JARVIE : In regard to the case Dr. Cook has presented, I would like to ask if it is not a fact that these fractures occur in teeth that are of a hard, dense structure, highly calcified, and if that is not the very cause of these fractures—the amount of lime making them more or less brittle. I have had a number of cases in my own practice where such fractures have occurred without any apparent cause. Molar teeth split throughout the entire length of their crown.

Dr. MILLS : Filled ?

Dr. JARVIE : Filled, and also teeth that were not filled. Teeth that were, to all intent, sound. They were filled so that it had no effect in weakening them. This excess of lime in the tooth makes it more brittle, and then any hard substance coming between the cusps brings a force to bear, and it splits.

Dr. MILLS : I would like to ask if these cases are very common ?

Dr. JARVIE : A year ago last Christmas it seemed that it must be very common, for I had three in one week—a remarkable week. I don't have them so as to have them common. I remember quite a number of them.

Dr. MILLS : Can Dr. Jarvie tell the teeth ?

Dr. JARVIE : One was a left upper second biscupid—a perfectly sound tooth that was split. Very much in the same style as Dr. Cook has shown.

Dr. MILLS : Can you tell about the occlusion ?

Dr. JARVIE : There was occlusion. The gentleman had a full set of teeth ; he had only lost one tooth.

Dr. SCOTT : Were they worn down ?

Dr. JARVIE : They were not worn down. This one of Dr. Cook is worn but little. The same week I had a second molar tooth on the right side of the upper jaw that had a cavity in the crown the size of a pin head, and that had been in there 30 years, and that was split through and through to the bifurcation, and at the time he was eating. He

noticed some trouble through the gum there, and said the filling had dropped out. It had simply opened, and the same week the corresponding tooth on the upper jaw split. All these were on the upper jaw. As I bring them to mind, I don't think of any on the lower jaw.

Dr. Cook : Dr. Mills speaks of giving opium to his patients for periostitis. It is not every one who can take opium with benefit, owing to some peculiar idiosyncrasy. Dover's powders might do as well.

Dr. Mills : I would like to say that my preference has come from this, that some people can take the wine of opium who can't take the laudanum. Taken in the case of children, the effect is quite different.

Dr. Crandall : I have a number of patients who cannot take opium in any form. For the past four years and more I have prescribed bromide of potassium as an internal remedy to all my patients suffering from periostitis, and with marked benefit in the great majority of cases ;—so few exceptions, indeed, that I have come to regard it as almost a specific in periostitis inflammation. I always recommend a hot foot-bath in conjunction with the bromide.

Some two years ago a lady, about 21 years of age, called early in the evening, complaining of intense pain and soreness in the right inferior first bicuspid—said she had been suffering since early morning. I think I never saw a more severe case of acute periostitis. The pulp cavity of this tooth had been filled some eighteen months. I scarified the gum, applied tincture of aconite, gave her four ten-grain powders of the potassium, told her to take one powder, dissolved in a little water, and repeat the dose in twenty minutes. She took thirty grains in the space of an hour, took a hot foot-bath with plenty of mustard in the water. Saw her next morning, found the tooth very loose, but no pain or soreness ; she said she went to sleep about 9 P. M., and rested well during the night. I value the idea of resting the tooth, preventing contact of the occluding tooth, as referred to by Dr. Mills. When I have occasion to drill into or work about a tooth sore to the touch, I gently place a wedge of wood or one of Dr. Jarvis' separating instruments between the offending tooth and the next adjoining, when I am able to operate with little or no pain to the patient.

I saw a case a few days since illustrative of the wonderful elasticity of Nature A lady, 30 years of age, had the first and second right inferior molars filled with amalgam nine years ago. The teeth were badly decayed when filled—the posterior proximal wall of the first molar gone, and the anterior proximal of the second molar wasted. The pulp in both

teeth completely exposed when filled, nothing was interposed between the filling and floor of cavities, the patient said the dentist did not treat or medicine the teeth The amalgam was firmly packed between the teeth far below the gum, bridging from one to the other, thus uniting them. She said they had been her main dependence for mastication for all those years, and had given no sort of trouble except an uncomfortable feeling as if something was crowded between them. Owing to decay about the margins I removed the fillings, and found the condition described, and refilled the teeth.

Treatment of Exposed Pulps :

Dr. Wm. Jarvie, Jr. : When I received the notice that I was expected to speak upon this subject, it seemed to me that I could say all I had to say in a very few words. But the more I thought upon it the more extended and broader the subject grew. But in the first place let us understand what the pulp is : The plup is the formative organ of the dentine, and is composed perhaps of four or five arteries, as many veins and nerves. On the surface of this organ is a layer of cells—peripheral cells or odontoblasts, which are the factors of the dentine. There is some doubt whether it is by the exudation of the lime salts from these cells, whether there is a direct conversion of the odontoblasts into dentine, but there is no doubt that the odontoblasts are the direct factors of the dentine. In taking into consideration what we would do in case of exposed pulp we must bear in mind what this organ is. Our treatment varies according to circumstances—according to the various conditions under which we find the pulp exposed, and in determining the treatment we must take these conditions under consideration. Some of these conderaitions are as follows :

The temperament and condition of the patient—

Whether the exposure be from removal of decay without previous pain ; whether it be from decay with slight previous uneasiness ; whether it be exposure from decay with pain having existed for some time ; or whether it be exposure with more or less supuration and slouging of the pulp ; whether the tooth had one straight root like the incisors, or have roots like the bicuspids and molars, with slender and tortuous canals ; whether the cavity of decay is of such a shape and extent as to require the use of the pulp chamber for the retention of the filling. If the patient should be in good health and of vigorous type, I might attempt to save a pulp alive, when with the patient in poor health and

enfeebled condition, and not likely to have a sufficient amount of lime salts in the blood to form new tissues, my treatment would be to devitalize. We know there are many people in whom the least irritation or inflammation continues to supuration, and in such cases I do not think it advisable to attempt to save an exposed pulp. The best course is to devitalize and extirpate at once. The second consideration was, whether the exposure was from the removal of decay in excavating and without previous pain. I think in every such case where the condition of the patient was favorable to success, I should endeavor to preserve the pulp alive.

In cases where the exposure is from decay, with slight previous uneasiness, if the patient was of a vigorous temperament, in almost every instance I would try to save the pulp alive ; but if not of such a temperment, I would certainly devitalize in all teeth back of the eye teeth. I should, in almost every instance do all that I could to preserve the vitality of the pulp in any of the six front teeth. My last expedient would be to destroy a pulp in those teeth.

In all cases, with the exception of the front teeth, when the pulp is exposed, with pain having existed for some time, I would devitalize the pulp, even with every constitutional tendency favorable. Another class of cases are those where there has been supuration and sloughing of a portion of the pulp. In all teeth back of the eye teeth, and I think in all mouths, I would devitalize the pulp at once. I would not attempt to save such a pulp alive, for the number of successes would not begin to compensate for the number of failures, ending with alveolar abscess. It is a question with a great many, when this outer layer of cells has been destroyed, whether any dentine of repair can be deposited. I know it is claimed by some that it not only can be, but that *it is* deposited. They have had cases under their own observation that proves it. Yet I believe all authorities agree in declaring that the odontoblasts are the direct factors of the dentine. Then the question is, how is it possible for dentine to be deposited over where these cells are destroyed? Perhaps, by the neighboring cells taking on increased action, so as to weep out lime salts, sufficient to extend beyond their own territory, and meet the exudation of salts from the cells upon the other side of the lapse of odontoblasts. I think in that way small exposures may be completely repaired.

But we need not care whether there will be a deposit of secondary dentine or not, as long as the pulp remains alive and healthy. Many cases of exposure are treated and no secondary dentine deposited, and the

pulp continue to perform its functions for many years. I have had cases in my own practice, where the pulp has been capped, and for some reason the capping removed after several years, and the pulp found in the same condition as when capped. No dentine having been deposited. In treating exposed pulps I make quite a distinction between teeth with one straight root, such as the front teeth, and the bicuspids and molars, the roots of which have pulp canals that are small and tortuous. In cases of failures to preserve the pulp in the front teeth it is a very easy matter to get at and cleanse such roots, and I think the successes in such teeth in reducing periosteal inflammation and in curing alveolar abscess, ought to be 99 out of 100. But in upper molars, for instance, it is almost impossible to thoroughly cleanse and purify the buccal roots where decomposition or putrefaction has taken place, and in proportion as we find this difficult or impossible to accomplish, do we fail to successfully treat disease in and about teeth. So, I say, where there is much doubt about successfully treating an exposed pulp in the molar teeth and where failure is to be denoted only by subsequent periostitis or alveolar abscess, devitalize the pulp, removing all of it that is possible, and all fragments left, so "mummyize" by creosote and oxychloride of zinc, that all trouble from decomposition and putrefaction is reduced to a minimum.

In the front teeth, and particularly in young people, I would do everything in my power to save the pulps alive. We sometimes have to treat teeth, when the cavity of decay is such that it is absolutely necessary to use the pulp canal as an anchorage or basis for our filling, and in such cases, even when we would be morally certain of successfully treating the exposed pulp, I should devitalize whether the tooth be a molar, bicuspid or incisor.

In devitalizing the pulp I have but one method, which is to saturate with creosote a small piece of cotton the size of an ordinary pin head ; with this take up a minute quantity of arsenic and place it in as direct contact with the pulp as possible and seal up the cavity with cotton saturated with sandrac varnish.

I have but one method in attempting to save a pulp. I have tried many ; I have tried capping with metal, plaster of Paris, pieces of quill, and for some time I used nothing but the oxychloride of zinc preparation. I now use the oxide of zinc mixed with creosote, in contact with the pulp, and covering this over with the ordinary oxychloride of zinc : the oxide of zinc mixed with creosote does not in itself make a hard mass ;

it will get harder in the course of time, even if there is no oxychloride in contact with it.

Dr. Fishbough: How long did you leave the arsenic in contact?

Dr. Jarvie: Usually three or four days. As a rule I send my patient away, to return in three days; I have had cases where it was necessary to leave it in much longer; I had one case where I had to renew the arsenical preparation at times for four weeks; I thought I was never going to destroy the pulp.

Dr. Chapman: I recollect that when I first commenced the practice of dentistry in Massachusetts, it was a very great annoyance to me to be running across red-hot pulps, and I wondered then if there was no way of getting around that difficulty. Of course, arsenic was applied, and the pulps were devitalized, and I went for them. The number of teeth that are filled with broaches are to my shame. It was left to me to come to Brooklyn to first hear the idea of capping the pulp. I proceeded to put the plan in practice, and I have capped with some success and some failures; I can only give it from memory. I know that pulps can be saved, I know they are saved; I never yet could understand why pulps were not as susceptible of treatment as any other tissue. Dr. Jarvie has expressed my views in regard to diagnosing conditions. There are different conditions in the same mouth; I do all my capping, and I think do considerable with oxychloride of zinc. I won't say how small a per centage have ever come back, but a large per centage that I have capped in the last five years have been under my constant supervision; I know they are alive. I do not care to take up any more time.

Dr. Mirick: When Dr. Jarvie was speaking I thought he was taking the opposite course from what I would do. He would make every attempt to save the front teeth and in the back teeth he would devitalize in a great majority of cases. I should take the opposite ground. I should endeavor to cap the pulp in all cases of back teeth in preference to the front teeth. In the centrals we have no difficulty in extracting the pulps and make a perfect success of it. I think, in a central incisor, where the pulp is thoroughly removed and the pulp cavity filled, it is as good as though the pulp was alive. But we all know that in the back teeth there is a great deal of difficulty in getting at the roots and filling the pulp canals thoroughly.

Dr. Hawes: We do not save the pulps alive when we think they are alive. I know, some 18 years ago, I filled a tooth for a gentleman, exposed the pulp thoroughly while excavating, and I treated with oxychlo-

ride of zinc and creosote. I used the oxide of zinc and I got it quieted down. I did not bleed it. It was the first molar on the right side, anterior proxmial surface of the tooth. I got it quieted down and filled it in a way that it did not impinge on the nerve. I filled with gold. The tooth has never ached to this day, but I know the nerve is dead. It did not show it was dead for as much as eight or ten years, but occasionally I would examine the teeth. The last time Dr. Seaver was present. We examined the tooth and we both concluded that the evidence was conclusive that the nerve was dead although it had never given any trouble, and I believe that in many instances, if we would examine, we would find them dead.

Dr. Cook: Will you favor us with your method of testing for the death of the nerve?

Dr. Hawes: From the color and testing with iced water. Dr. Seaver himself tested thoroughly and we were both satisfied the nerve was dead. I have been a little afraid to state my convictions because there has been so strong a feeling and so strong a prejudice against destroying pulps in some quarters. I do not know exactly. I told a lady it was quite a mooted question whether the nerve should be destroyed. Some ladies do not like to have nerves destroyed. I find gentlemen do not come out and tell whether they destroy nerves or not. This is the best confession tonight that I have heard at any meeting for two or three years. There are very few gentlemen who are brave enough to stand up and say they destroy nerves. A gentleman said he would not use arsenic under any circumstances. I think arsenic is a pretty good friend to the dentist. I have found a great deal of satisfaction from it.

Dr. Cook: I have had for the last thirty years, occasionally, formerly frequently, less frequently latterly, to destroy the pulps. I don't know what has happened to my friend Dr. Atkinson, but in order to help him out and give a little courage to my friend Hawes, I want to say that Dr. Atkinson has somewhat changed his tactics, as I do personally know, for my own ears are to be trusted, and some of the other gentlemen will bear the same testimony. The time is past when under all circumstances a six-year molar must be preserved. I did hear him declare that three should come out. I have no doubt that under certain circumstances I destroy pulp, and I think we all find ourselves compelled to do so; that is the easier method for the patient. The tooth comes at last with the pulp dead, if we don't help it to die easily and quickly. In my experience of the past few months I must say that I

covered what I considered to be live, healthy pulps, with filling, and they have died, and I have never been notified by the patient. The patient may have gone somewhere else. I filled a number of those teeth, and almost without exception, at least the majority have been in what we call double teeth ; and the patients, sometimes after a month, two months or three months, when they have come for other things or purpose, have said the tooth has not hurt them much. I feel there is a little left there. If pulps die and make no sign, all right ; only this, if under such circumstances, with a temporary filling in the tooth, I would remove the filling, and proceed in the usual method to make the funeral as lasting as possible.

May I relate a single case—a case interesting for its very obstinacy. A second bicuspid filled with gold by a Philadelphia gentleman. I learned to-day that he had a little doubt about it at the time. The lady, before it was filled, complained of the tenderness—periostitis, I suppose, a little. I treated as best I could ; iodine, blistering, and internal remedies. I fancy she was enciente. I at last removed the gold filling, attempting to soothe it by that treatment. It would not be soothed, and at last I destroyed the pulp. I filled the root with cotton saturated with wood creosote. But for the last two weeks or more she has had no comfort. I thought I had removed all the pulp, but to-day I removed a large particle of the decomposed pulp. Under the circumstances I don't know that it was possible to save that pulp, I did all I could, all I knew how to do—I used every means to save the pulp. Our lady patients I think come to our offices under different circumstances than our male patients do. I tell them that the capping nature has placed there—the bone I would treat with creosote. I mean wood creosote when I say creosote. Not coal tar, but wood creosote, and there is a very marked difference. One is not an escharotic and the other is in the ordinary use of that term.

When I cap an exposed pulp, I first place a little bit of bibulous paper, saturated with wood creosote, over the exposed portion of pulp, and over that a mixture of the oxide of zinc and creosote, leaving sufficient strength for the filling of oxychloride of zinc. I shall not be surprised at any time if a person comes in and says, "my tooth is sore." I have been surprised at the success. I have had more funerals than I wanted.

Dr. Jarvie : Do you ever bleed a pulp?

Dr. Cook : Not intentionally. Why should we bleed a pulp, as a

rule, when we don't bleed the general system? We may, under some circumstances, require bleeding, but not as a rule. The Italian physicians are bleeding constantly. It is suggested, in the case of King Emanuel, that he was bled to death. His physicians bled him. It is not known the amount of blood that was taken, but if he had been in Paris, in Vienna, in Berlin, in London, he would not have been bled, as I learn from an article that I read in the London *Lancet* a few days ago. It is a question, perhaps, whether we should bleed. If we can restore the pulp to healthy action without bleeding—if the pulp stays all right, or has yielded to the treatment, why bleed it? It may be all right; I don't say it is not, but I don't see why there should be any local bleeding under such circumstances when the difficulty is local.

Dr. CHAPMAN: I think Dr. Shannon made that remark, and I took him up on it. The pulp becomes gorged, and is imprisoned in its walls. It has no chance to expand and relieve itself. I have never bled a pulp, and I am careful not to; but it does not alarm me at all if it does bleed. A pulp freshly exposed I would not bleed if I could help it. I think the important point is to cap the tooth dry. I think as we approach the pulp the presence of the saliva is a bad thing. You don't get near a pulp before it is congested.

Dr. COOK: I only want to ask why congestion in a pulp is not amenable to the same treatment as congestion in any other organ? The circulation is there. Nature has established her circulation. Simply that it is confined is not a sufficient reason.

(*To be Continued.*)

AMERICAN DENTAL ASSOCIATION.

To the Editor of the Miscellany:

At the last meeting of the American Dental Association, which was held at Chicago, the following Committee was appointed for local work: Drs. G. C. Daboll, Geo. L. Field, C. R. Butler. Unfortunately the two ends of the committee have deemed it advisable to leave the country for a time, leaving the *center* only intact; and I, being said center, have made the following arrangements for our next meeting, at Niagara Falls. Grant's Hall has been secured for our meetings. Rates for delegates and their wives will be, at the International Hotel, $3 per day; at the Cataract House, $2 50. These rates include omnibus and baggage to and

from the hotel. Rooms at either hotel may be engaged in advance. Those stopping at the International are entitled to a free ticket of admission to Prospect Park during their stay, as to other places of interest at the Falls. I would say that no arrangements have been made as yet for a reduction of rates for members of the Association, but I shall make it my business to see what concession can be obtained. In railroad matters I have not succeeded in doing much. The New York and Erie will give their agents at Newark and Paterson instructions to sell excursion tickets to the Falls and return, good for the term of the Association, at $16 ; Mr. Abbott also writes me that he will give reduced rates from other stations on the road. Those wishing to pass over this road would do well to correspond with Mr. Jno. N. Abbott, General Pass Agent, New York, at an early date. The Canada Southern and Great Western roads of Canada will sell tickets over their lines at half rates. The Toledo and Wabash roads will do the same. *In all* cases the delegates will be required to present to the ticket agent a certificate from either the President or the Secretary of the society he represents, certifying that he is a proper person to receive said reduction. These certificates can be obtained by the society officers of the General Ticket Agent of the above-mentioned roads. Michigan roads will make no reduction. If the Association met in that State half-rates might be secured. I shall make no further effort in railroad matters, as it will be better for members living near one locality to make their own arrangements and secure concession for themselves. And again, if I should be *too* successful in this committee work, I might be placed in a similar position again ; and, as this year will bring honors sufficient, I wish no more. Respectfully,

GEO. L. FIELD,
Local Committee A. D. A.

NOTES.

Pennsylvania State Dental Society.

The Executive Committee take pleasure in announcing the following programme for the meeting of this society, at Bedford Springs, Penn., commencing July 30th, at 10 A. M., and continuing three days.

ESSAYS.

1. Thirty years experience with anæsthetics. By S. Welchens, D.D.S.

2. A review of the conservative treatment of the dental pulp. By Louis Jack, D.D.S.

3. Ante and Past professional education. By H. Gerhart, D. D. S.

4. The Accepted Creed. By Prof. C. N. Pierce, D. D. S.

5. Gold and Tin in Combination. By Prof. D. D. Smith, D. D. S.

6. Artificial Crowns. By Prof. E. T. Darby, D. D. S.

7. Why do Fillings Fail? The electro chemical theory of the "New Departure" *vs.* Defective Manipulation and Defective Structure. By W. H. Trueman, D. D. S.

8. "Tissues." By Marshall H. Webb, D. D. S.

9. Discoloration of the Teeth. By G. W. Adams, D. D. S.

10. Subject to be announced. By R. Huey, D. D. S.

11. Address of the retiring President, By C. S. Beck, D D. S.

SURGICAL CLINICS.

A tumor, the inferior maxillæ, extending from the first molar on the left to the first bicusped on the right side, will be removed. By Prof. Chas. J. Essig, D. D. S.

OPERATIVE CLINICS.

Cohesive gold impacted against and over frail enamel so that such walls may be encased and protected by gold and restoration of the contour of missing tissue by the aid of a new Electro Magnetic Mallet. By Marshall H. Webb, D. D. S.

The use of Williams' Cylinder illustrated. By Robt. Huey, D. D. S.

Restoration of contour by the aid of the Electro Magnetic Mallet. By Geo. B. McDonneld, D. D. S.

Operation with the Electro Magnetic Mallet. By E. P. Kemer, D. D. S.

Operation. By H. C. Longnecker, D. D. S.

A number of new appliances will be exhibited by inventors, including file carriers, syringe, chairs, engines and many others, by the manufacturers. The committee desire to make this an interesting feature of the meeting and will make suitable provisions for the exhibition of any inventions or objects of interest to the society that may be presented.

Excursion tickets can be procured in New York, Baltimore, Washington and all the cities of this State. Also at all the principal stations of the Philadelphia and Erie, the Northern Central and the Pennsylvania Railroads. Persons desiring to go from Bedford to the American Dental Association which meets at Niagara Falls the following Tuesday, can purchase tickets for Niagara Falls *via.* Harrisburg or Tyrone, and at these points buy excursion tickets to Bedford, and as they return to these points resume their journey on their Niagara Falls ticket.

Bedford Springs is one of the most healthful and popular Summer resorts, consisting of a group of some 20 or 25 springs with names as various as their compositions, each spring being named after the predominating mineral held in solution. The hotel has ample accommodations for all, and the rates to persons attending the meeting, will not exceed two dollars per day.

G. W. KLUMP,
Ch. Exec. Com.

WILLIAMSPORT, Pa.

Southern Dental Association.

The next meeting of this Association will be held at Niagara Falls, on the first Tuesday in August, 1878, instead of Atlanta, Ga. L. D. CARPENTER,
Chairman Exc. Com.

ATLANTA, Ga., June 21st, 1878.

American Dental Convention.

The Twenty-Fourth Annual Meeting of the American Dental Convention will be held at Niagara Falls, commencing August 6th, 1878. All members of the Profession are invited to attend.

AMBLER TEES, *Sec'y.*

Dental Alumni Association of Harvard University.

5 Newbury St.,
BOSTON, June 28, 1878.

Editor of Dental Miscellany:

The Seventh Annual Meeting of this Association was held at the Revere House, Boston, June 27. The following board of officers was elected: President, H. C. Merriam, Salem, Mass.; Vice-President, E. P. Bradbury, Boston; Secretary, T. O. Loveland, Boston; Treasurer, Edward Page. Yours very truly.

T. O. LOVELAND,
Secretary.

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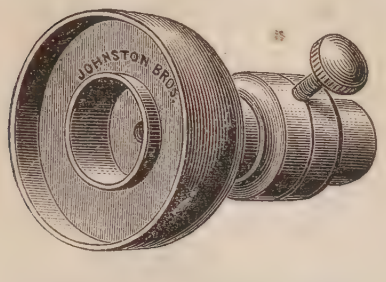

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3. The Japanned Gasometer.

Plainer, but otherwise same as above $90 00

4. Tripods—for holding cylinders of Liquid Nitrous Oxide, when one desires to dispense with the morocco case of the Surgeon's Case, or with the gasometer.

Price of Tripod, for 100 gallon cylinder	$4 00
Same with filled cylinder, and all needed adjuncts	34 00
Price of Tripod for 1000 gallon cylinder	8 00
Same with 1,000 gallons of gas, and cylinder, and all needed adjuncts,	103 00

5. The Suspension Engine—with Cone Journaled Hand-Piece The steadiest and most accurate dental engine made.

Price.....$50 00
With Lock-Bur Right Angle.....$55 00

6. The Remodelled Morrison Engine.

Price.....$30 00
With Cone Journaled Hand-Piece..... 35 00
With Lock-Bur Right Angle..... 40 00

7. Johnston's Adjustable Fountain Spittoon.

Can be adjusted to any height of the chair, and moved to and from the patient, giving the operator the opportunity to work on either side of his chair, without annoyance from the spittoon.

Price, handsomely plated.....$60 00

The Dentist's Appointment Book
and Pocket Record.

Printed in Carmine and bound in Morocco, with rubber fastenings and card pocket, $1.25

JOHNSTON BROS.

DENTAL PICTURES:

Pictures on Dental subjects are not very numerous, and will always possess interest to practitioners of dentistry. Having reproduced several copies of ancient paintings and engravings, illustrative of dentistry in other countries and in olden time, as frontispieces for the Dental Miscellany, we have, at the request of friends, also printed them upon plate paper, in suitable form for framing or for preservation in a portfolio.

Those now ready are—

1. Der Zahnarzt—From a Steel Engraving of 1672.
2. The Tooth Drawer—English.
3. The Monkey as a Dentist—From a painting by DeCamps, 1840.
4. Der Zahnbrecker—From a German Plate.
5. Transplantation—1787. By Rowlandson.
6. The Ludicrous Operator. By J. Harris, London, 1768.
7. Primitive Dentistry. Scene in Persia by an eye witness.
8. Fifth Pair of Nerves—not colored. From Tomes' Dental Anatomy.

Price each, by mail, 50 cents.

JOHNSTON BROS.,
Broadway, cor. 32d St., N. Y.

FLOSS SILK.

A superior article, per dozen, $1 50.

JOHNSTON BROS.,
1260 Broadway.

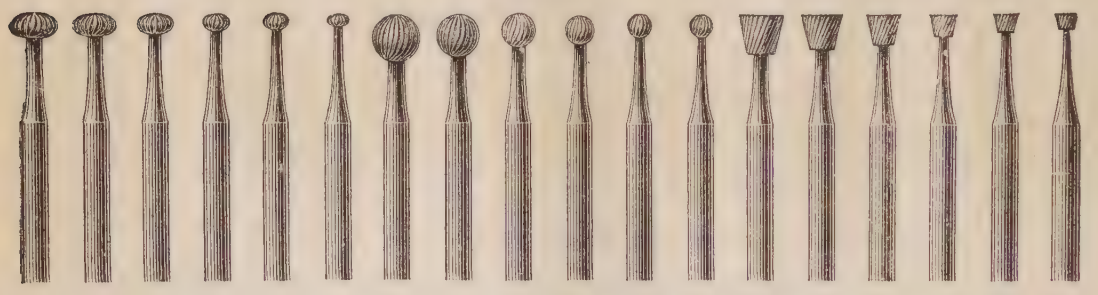
CATALOGUE OF
Instruments for Dental Engines.

Each Bur will fit either the Morrison, Suspension or White Engine.

Patented September 10, 1872, February 24, 1874.

PLUG FINISHING BURS.

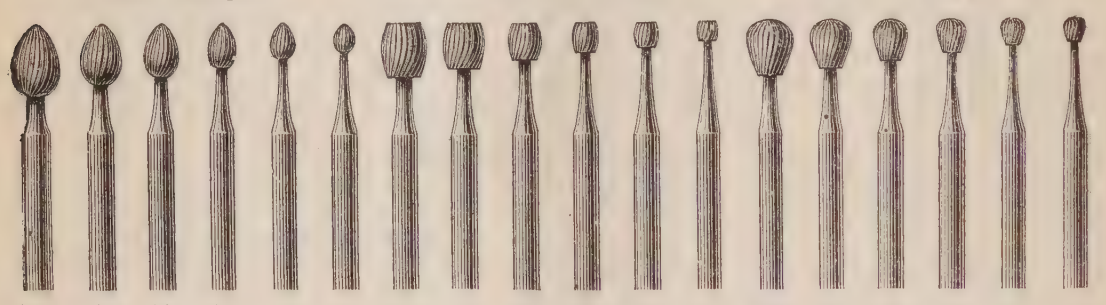
Oval. **Round.** **Inverted Cone.**



0 1 2 3 4 5 5¾ 6 7 8 9 10 10¾ 11 12 13 14 14¼

60 cts. 50 cents. 60 cts. 50 cents. 60 cts. 50 cents.

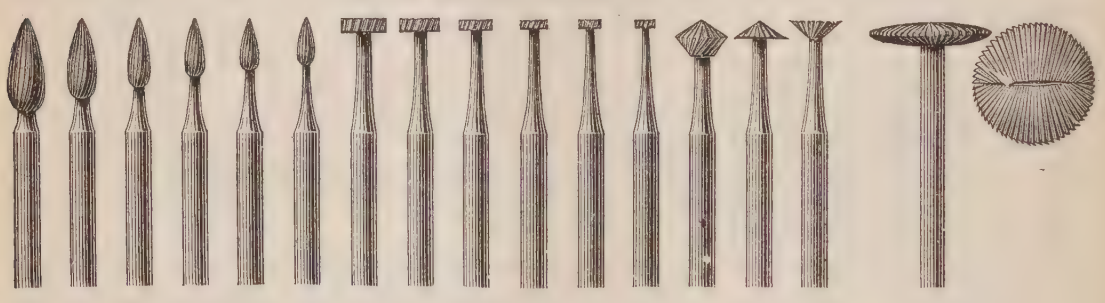
Bud Shape. **Barrel Shape.** **Pear Shape.**



14¾ 15 16 17 18 19 19¾ 20 21 22 23 23¼ 23¾ 24 25 26 27 28

60 cts. 50 cents. 60 cts. 50 cents 60 cts. 50 cents.

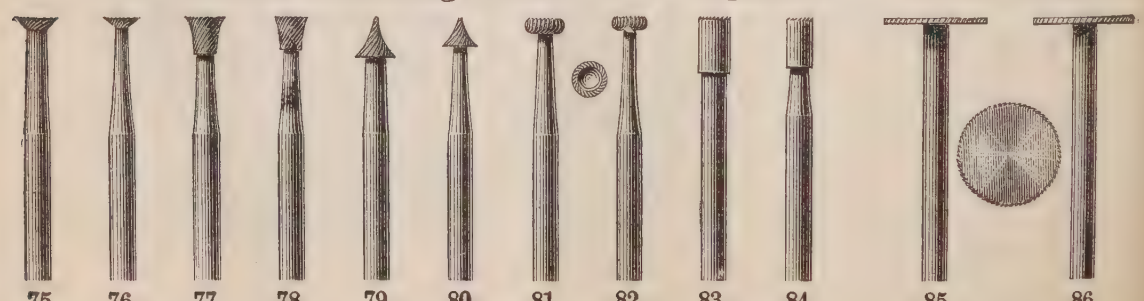
Flame Shape. **Wheel Shape.**



29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44

60 cts. 50 cents. 60 cts. 50 cents. 60 cents. $1.25.

New Forms Finishing Burs. **Trephines.** **Plate Saws.**

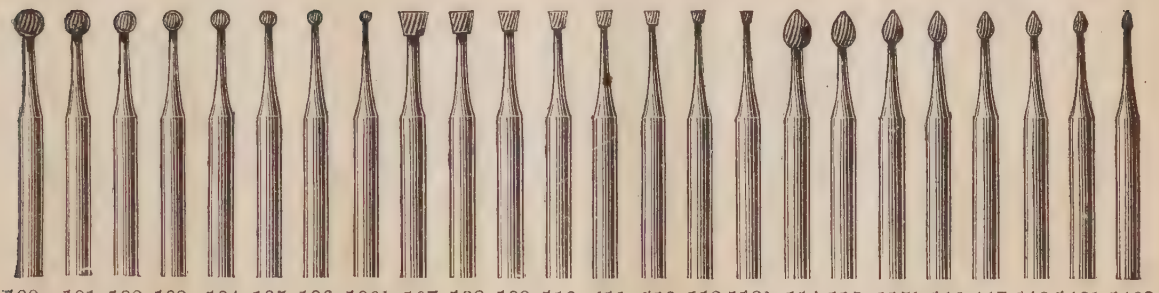


75 76 77 78 79 80 81 82 83 84 85 86

60 cents each. 75 cts. each. $1 00 each.

CAVITY INSTRUMENTS.

Round. **Inverted Cone.** **Bud Shaped.**

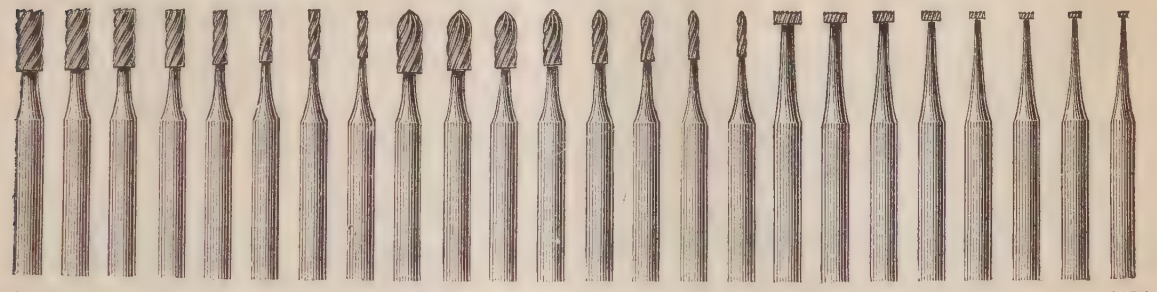


100 101 102 103 104 105 106 106½ 107 108 109 110 111 112 113 113½ 114 115 115½ 116 117 118 118½ 118¾

25 cents each. 25 cents each. 25 cents each.

For extra large sizes of these forms see below, Nos. 154 to 177.

Square Fissure. **Pointed Fissure.** **Wheel.**

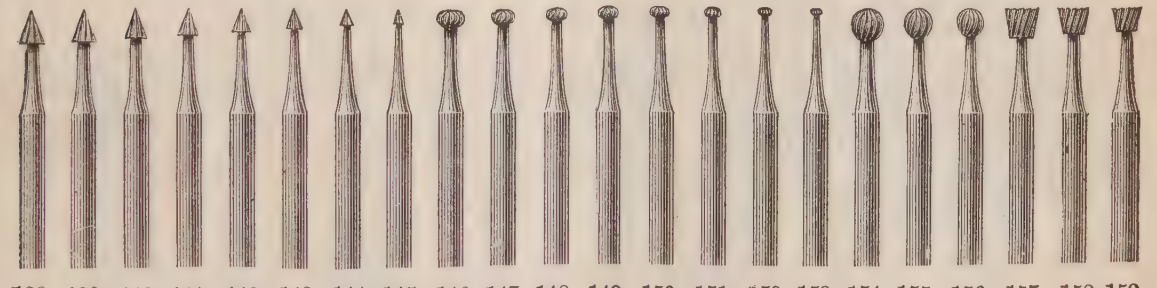


119 120 120½ 121 121½ 122 123 124 125 126 126½ 127 128 129 130 130½ 131 132 133 134 135 136 137 137½

25 cents each. 25 cents each. 25 cents each.

For extra large sizes of these forms see below, Nos. 154 to 177.

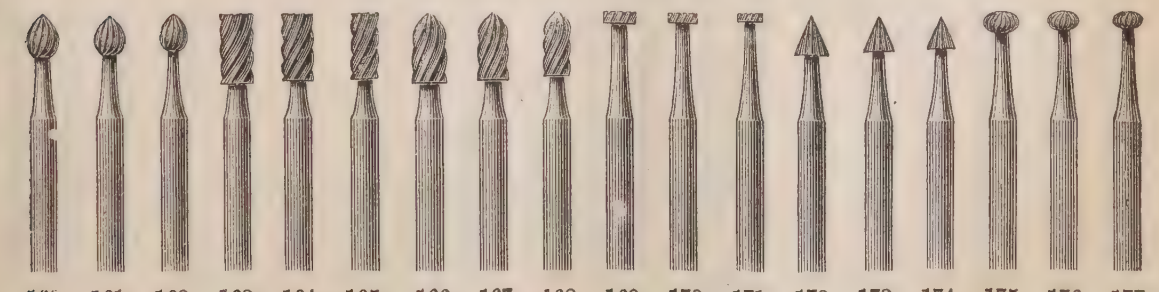
Cone Shaped. **Oval.** **Extra Sizes.**



138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159

25 cents each. 25 cents each. 35 cents each.

Extra Sizes of Various Shapes.

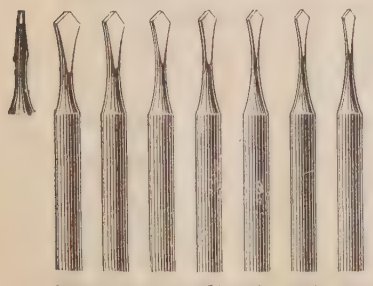


160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177

35 cents each.

CAVITY INSTRUMENTS.

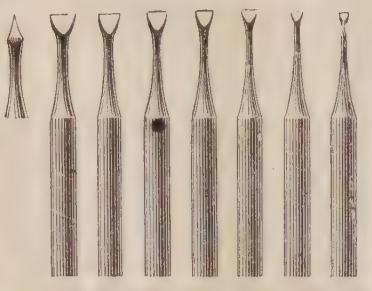
Spear Shaped Drills.



200 201 202 203 204 205 206

25 cents each.

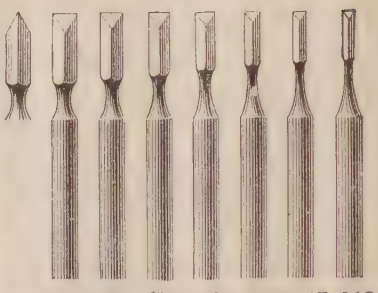
Spade Drills.



207 208 209 210 211 212 213

25 cents each.

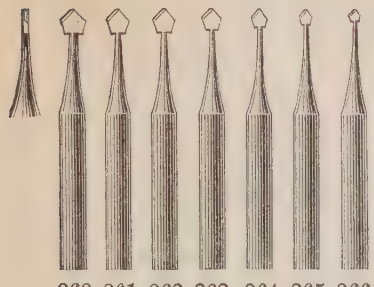
Square Drills.



213¾ 214 214½ 215 216 217 218

25 cents eaeh.

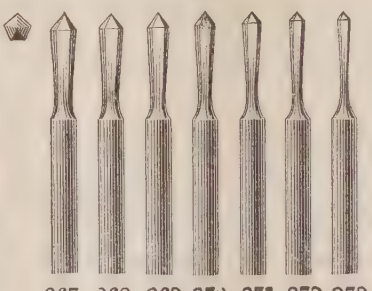
Forbes Drills.



260 261 262 263 264 265 266

25 cents each.

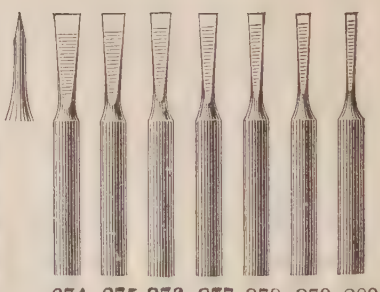
Five Sided Drills.



267 268 269 270 271 272 273

25 cents each.

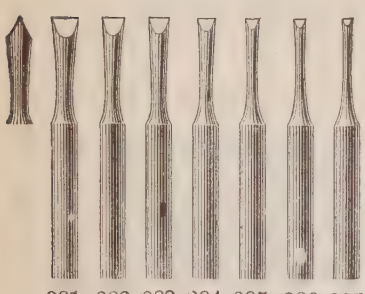
Flat Drills.



274 275 276 277 278 279 280

25 cents each.

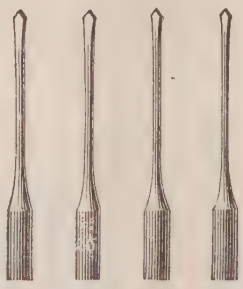
Round Drills.



281 282 283 284 285 286 287

25 cents each.

Drills for Mack's Screws.



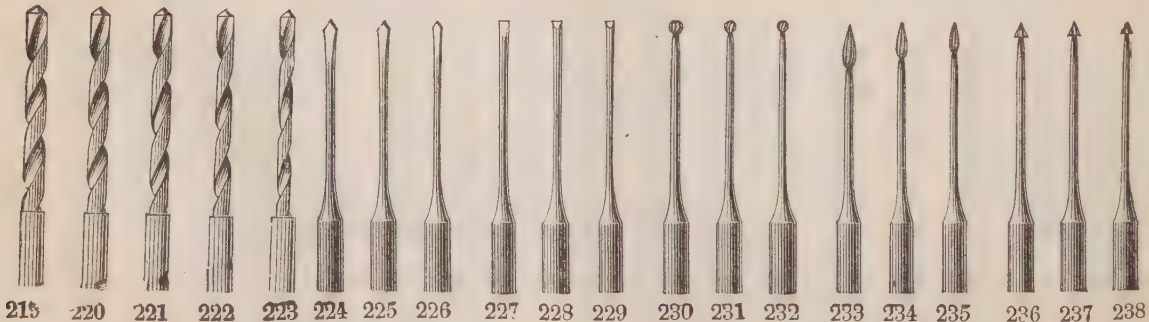
288 289 290 291

40 cents each.

No. 291 is for Gold Screw No. 1
" 290 " " " " 2
" 289 " " " " 3
" 288 " Pivoting Screws.

NERVE INSTRUMENTS.

Twist Drills. **Spear Point Drills** **Round Drills** **Round Burs.** **Flame Shape Burs.** **Cone Burs.**

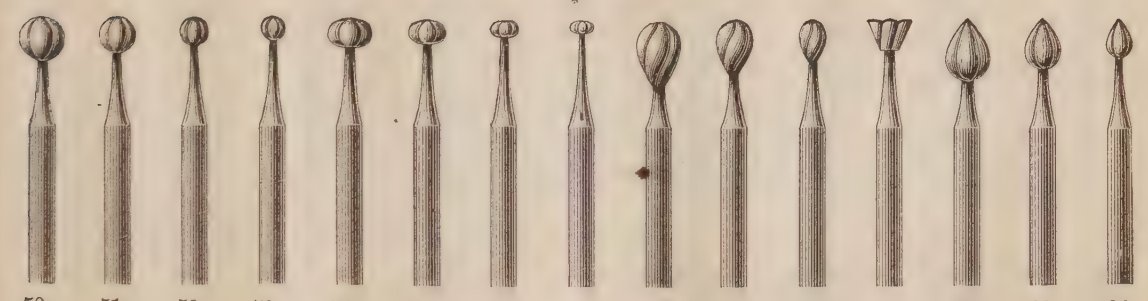


219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238

40 cents each.

Miscellaneous Finishing Instruments.

Burnishers.



75 cents each.

Same sizes, not corrugated, 50 cents each.

Screw Mandrel, without Collar.

No. 65.

13 cents.

Screw Mandrel.

No. 66.

25 cents each.

Port[illegible]lisher.

No. 67.

Screw Socket, Nickel Plated, 35 cents each.

Plain Chuck for Wood Points.

No. 69.

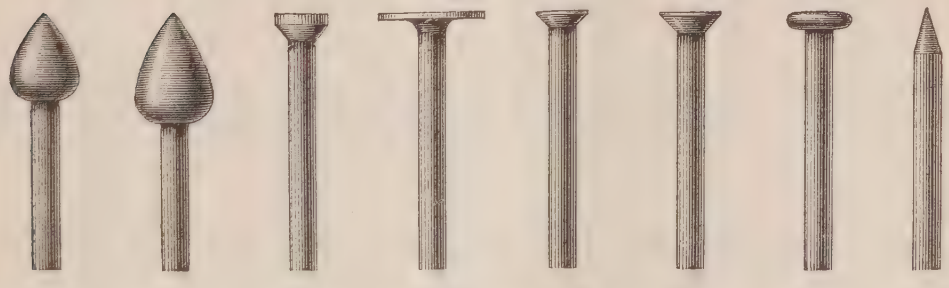
Plated, 35 cents each.
Plain, 25 " "

Parting Nut Mandrel.

No. 6[illegible]

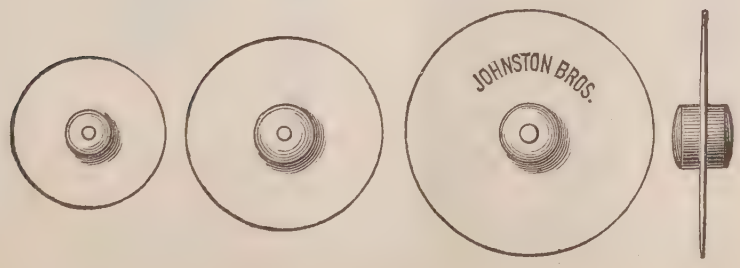
Nickel Plated, 40 cents each.
Plain, 30 " "

Wood Polishing Points.



Per Box of 100, assorted, $1.25.

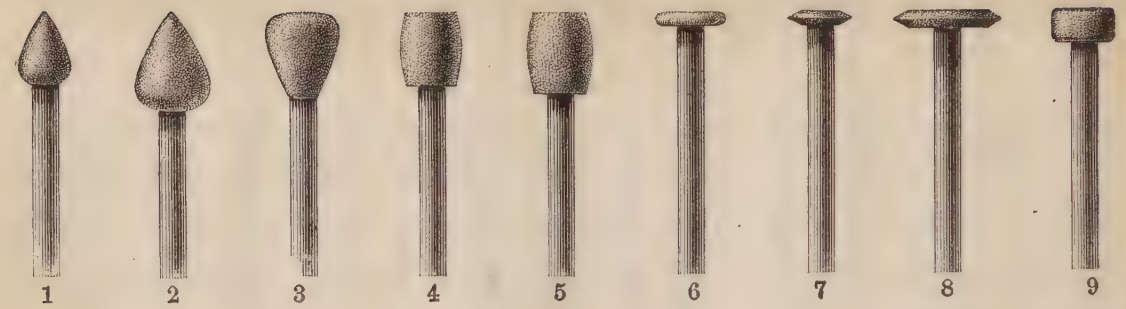
Boxwood Disks.



Price, per dozen, $1.00.

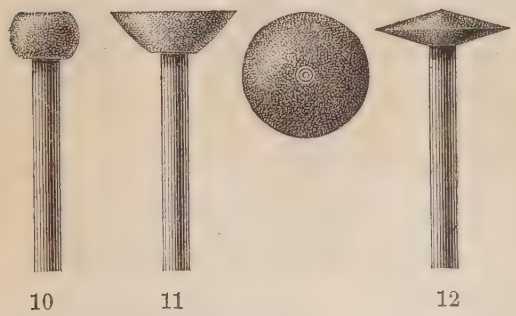
CORUNDUM POINTS.

Forms by Dr. A. L. Northrop.



1 2 3 4 5 6 7 8 9

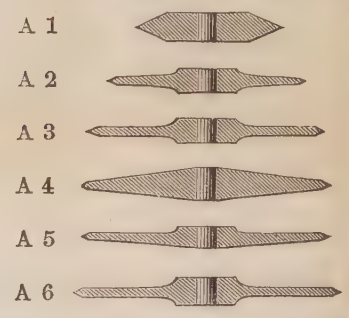
Rubber Disks.



10 11 12

Very thin, 7-16 in. diameter.

13



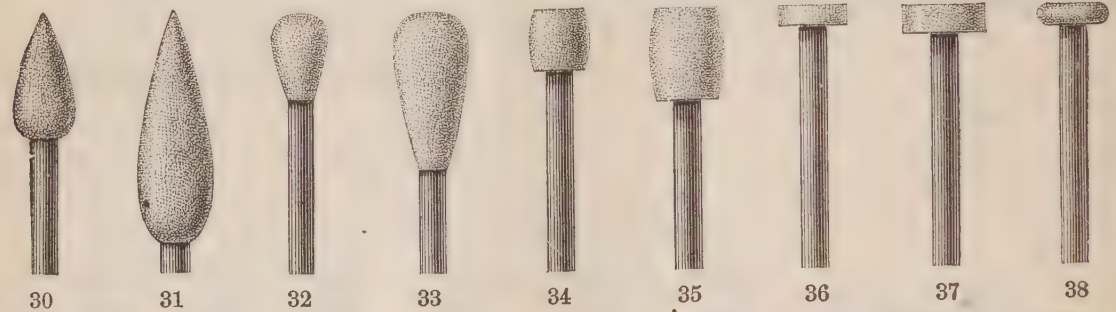
Mounted, per set.....$1 50
Mounted, per dozen..... 1 50
Not Mounted, per set..... 75
Not Mounted, per dozen..... 75

Wheels as in cut No. 13, per dozen.....$1 50
Or Mounted, per dozen..... 2 75
Rubber Disks, Hard, per dozen } 1 20
Rubber Disks, Soft, per dozen }

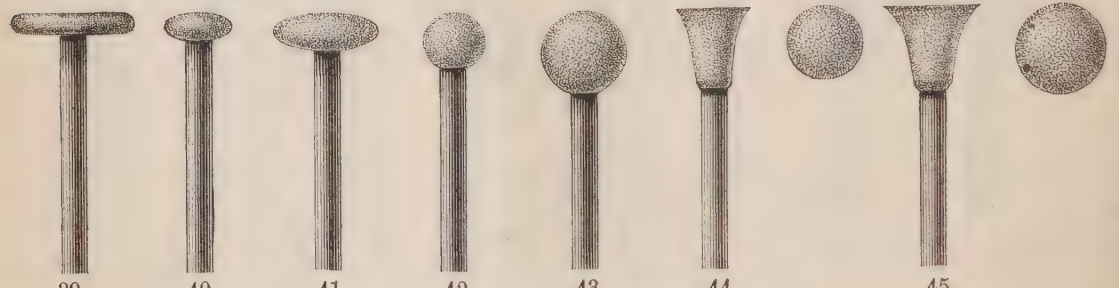
Soft Rubber Points, Shapes of Corundum Points, per dozen.....75 cents.

ARKANSAS AND HINDOSTAN STONE.

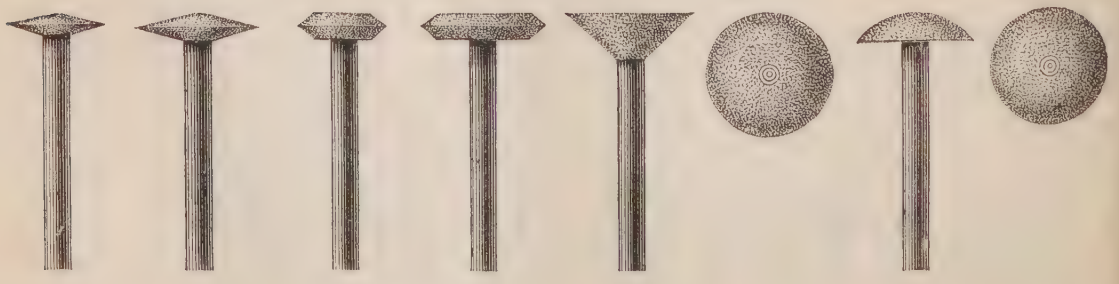
These are kept in stock, mounted on Mandrels, of the forms represented below. Scotch Stones will be made to order of any of the same forms, but this Stone is so soft, that we do not deem them desirable except for such shapes as are without sharp angles.



30 31 32 33 34 35 36 37 38



39 40 41 42 43 44 45



46 47 48 49 50 51

Arkansas Stones, $1.00 each. Hindostan Stones, 50 cents each. Scotch Stones, 30 cents each.

STONED BURS.

The teeth of these Burs are laid out with great accuracy, and then filed to *exactly equal length,* but are not brought to a cutting edge. The Bur is next tempered, and each tooth *afterward* stoned to a fine edge. This secures a Bur perfect in all its cutting edges, and unequaled by anything of the Bur kind. Those who have used these most, rarely buy any other kind, and assure us that they find true economy, as well as great satisfaction in their use.

We invite the fullest examination of all of our Engine Instruments, as regards

The quality of the steel from which they are made.
The shape and finish of the cutting edge.
Their temper.
The rapidity with which they cut.
Their durability.

The shaft of each instrument is *round and highly finished,* and can therefore be used without unreasonable and unnecessary injury to the nose of the hand-piece, which injury occasions unsteadiness in all the uses of the Engine.

They will *bear* examination in *quality* and *price.*

MINIM BURS.

It is impossible to accurately represent by cuts the smallest sizes of Burs that we make. We offer Cavity Burs, either Round, Inverted Cone, Bud-Shaped, Wheel, Cone-Shaped or Oval, of smaller sizes than are represented or numbered herein. Although more than ordinarily expensive to make, **we keep the price the same as for ordinary Cavity Burs.** In sending orders, please specify the shape desired, as for example: "ONE DOZEN ROUND MINIM BURS."

SPECIAL OFFER.

A discount from list prices of ten (10) per cent. will be given on all cash orders for Engine Instruments which amount to twenty-five dollars or upwards.

PRICES OF ENGINE EQUIPMENTS.

Plug Finishing Burs	$6 00 per doz.		50 cts. each
Extra Size Finishing Burs	7 20 "		60 "
Stoned Finishing Burs	12 00 "		1 00 "
Extra Sizes proportional prices.			
Excavating or Cavity Burs	3 00 "		25 "
Extra Sizes	4 20 "		35 "
Stoned Excavating or Cavity Burs	6 00 "		50 "
Stoned Excavating or Cavity Burs, Extra Sizes proportional prices.			
Minim or very Small Burs, Round, Bud, Wheel, or Cone shaped	3 00 "		25 "
Right Angle Cavity Burs and Drills	3 00 "		25 "
Trephines			75 "
Screw Mandrels, with Collar	3 00 "		25 "
Screw Mandrels, blanks (no collar), for Mounting Wooden Wheels, Leathers, &c	1 50 "		13 "
Large Knife Edge Wheel Burs			1 25 "
Plate Saws			1 00 "
Burnishers, Corrugated	9 00 "		75 "
Burnishers, Smooth	6 00 "		50 "
Parting Nut Mandrels, Nickel Plated	4 80 "		40 "
Parting Nut Mandrels, plain	3 60 "		30 "
Drills of all forms and sizes (except Nerve Drills)	3 00 "		25 "
Nerve Instruments	4 80 "		40 "
Leathers, Mounted	3 00 "		25 "
Leathers, not Mounted	1 00 "		10 "
Bands for Engine, Morrison	1 20 "		10 "
Bands for Engine, Suspension	1 80 "		15 "
Ive's Tongue and Cheek Protectors (2 sizes), to be used with disks, wheels, &c	per set, 1 50		75 "
Right Angle Attachments			5 00 "
Arkansas Stones, Mounted	12 00 "		1 00 "
Hindostan " "	6 00 "		50 "
Scotch " "	3 60 "		30 "
Corundum Points, Mounted	1 50 "		13 "
Corundum Points, not Mounted	75 "		7 "
Rubber Disks, hard or soft	1 20 "		
Twist Drills	4 80 "		40 "
Boxwood Disks (3 sizes, see cut)	1 00 "		10 "
Wood Socket or Port Polisher, plain			25 "
Wood Socket or Port Polisher plated			35 "
Wood Socket or Port Polisher, Screw Socket			35 "
Corundum Wheel, No. 13, $\frac{7}{16}$ in. diameter	1 50 per doz.		13 "
Soft Rubber Points, shape of Corundum Points			75 cts. per doz.
Wood Polishing Points			$1 25 per Box.

We are prepared to furnish any of the instruments illustrated in this pamphlet, adapted to either the A, B, or C style Hand Piece. The C style Instruments also fits the S. S. White Engine, and Cone Journaled Hand Piece.

In ordering instruments, designate them by the numbers, and state whether they are wanted to fit the (A,) (B,) or (C) hand piece. Each bur is numbered on its shank.

Style A.

Style B.

Patented Sept. 10, 1872.

Style C.

Patented Feb. 24, 1874.

NOTE.—To fasten Burs in the Hand Piece, it is well to push back the catch-spring with the left hand while inserting the Bur with the right hand.

JOHNSTON BROTHERS'

Cone Journal Hand-Piece.

The only Hand-Piece which stands the test of long use without wearing shakey and out of true.

THESE HAVE BEEN IN USE FOR NEARLY TWO YEARS, AND ARE STILL RUNNING TRUE AND IN GOOD CONDITION.

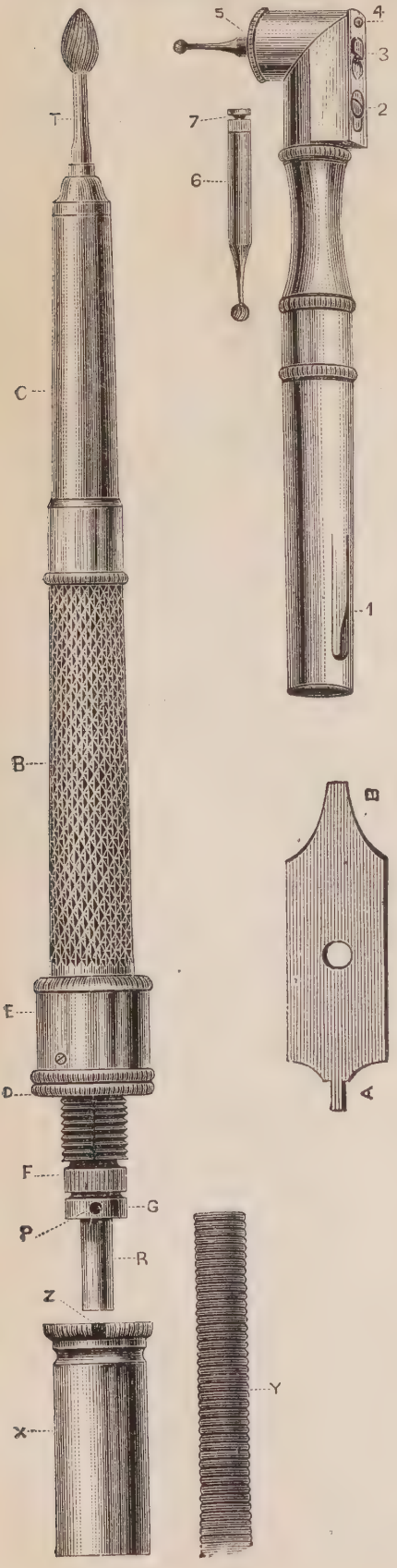
IN THE ESTIMATION OF MANY WHO HAVE THE CONE JOURNAL HAND-PIECE IN USE, IT ADDS A HALF TO THE EFFECTIVENESS, AND HENCE TO THE VALUE OF THEIR ENGINES.

IT IS READILY ATTACHED TO EITHER OF THE ENGINES MADE BY US, OR TO THE S. S. WHITE.

SEE THE FOLLOWING PAGES FOR DESCRIPTION, CUTS, AND TESTIMONIALS.

THE CONE JOURNAL HAND-PIECE,

THE GREATEST IMPROVEMENT IN DENTAL ENGINES SINCE 1872.



No matter how hard the bearings of a Dental Hand-piece may be made, if they are constructed as they have been hitherto, they will soon wear loose and shakey, and allow the bur to wabble.

By making them conical we secure two great advantages.

1st. The Journals are larger, and so present more surface to stand the wear.

2d. The little wear there is can, at any time, be taken up by forcing the cone on the spindle further into its seat, so preventing any shake and at the same time bringing the spindle to a true centre.

In our Cone Journal Hand-piece the cones are large and are *all of hardened steel*, and in addition are very carefully protected, so that it is almost an impossibility for any polishing or grinding material to get to the bearings. In the old styles of Hand-pieces it will be remembered the shank of the bur goes inside the nose-piece, and directly through the principal journal of the Hand-piece into the spindle, and so frequently carries in the polishing material used—be it pumace stone or corrundum. In the Cone Journal Hand-piece the spindle extends out-

side the nose-piece, and the bur goes into a socket in its end, thus making it impossible for the bur to carry any dirt to the journals or bearings. There is no opening through the case of the Hand-piece through which oil can find its way to the hands of the operator or to the lips of the patient. The right angle slips on over the end of the Hand-piece and securely locks itself so that it will neither revolve nor detach itself.

An Improvement only Found in this Hand-Piece.

The right angle burs are securely held in the right angle by a new locking device, which is both simple and effective.

The end of the spindle R. is bored out at the end to receive the end of the cable of the S. S. White engine, while the outside is properly sized to take the regular driving spring of the Morrison engine.

A small screw-driver and directions for taking apart accompany each Hand-piece, though, with a fair usage neither need be touched for months, certainly not until it is necessary to clean the Hand-piece.

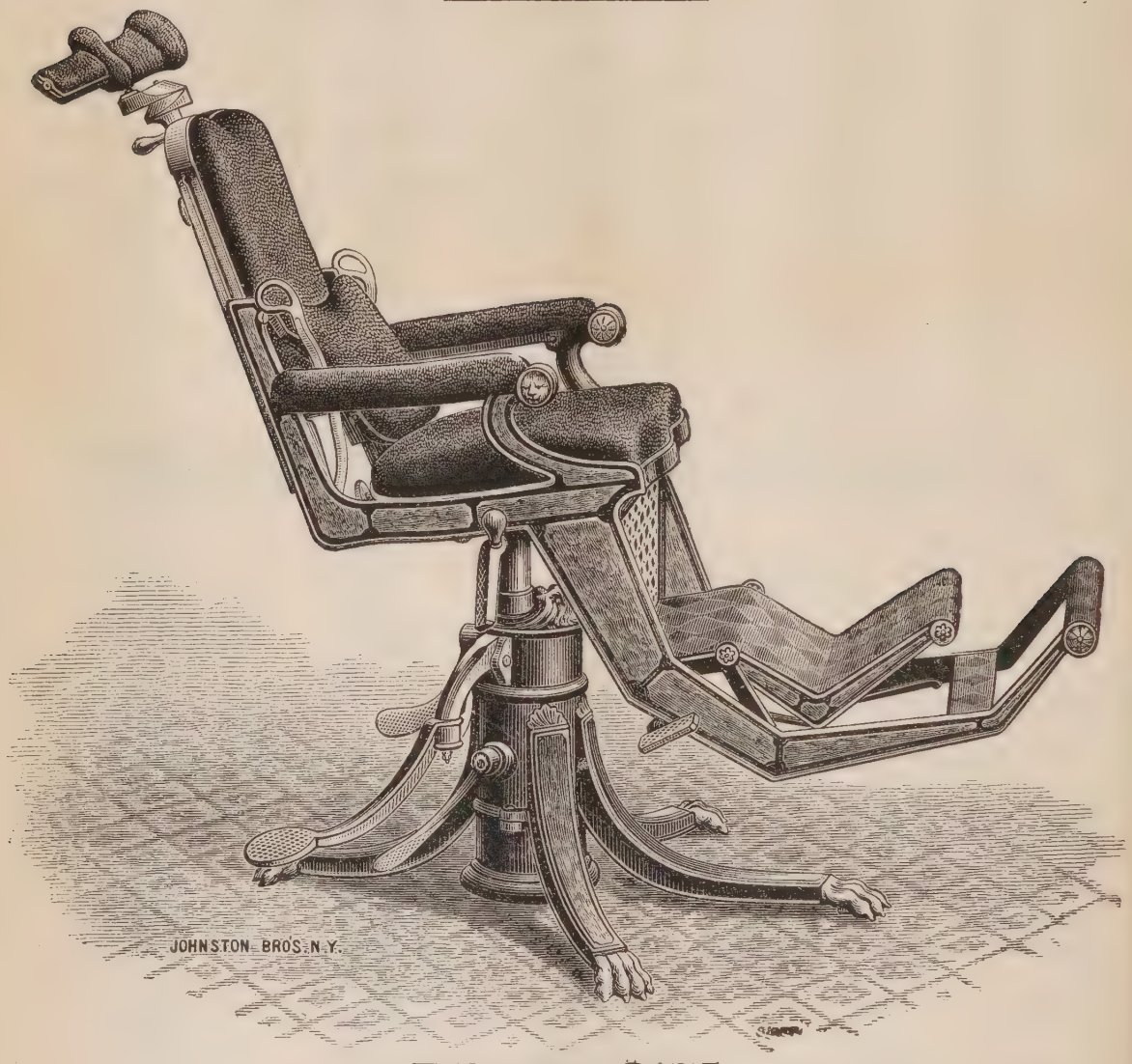
The burs used with other engines or hand-pieces—or the various attachments for the S. S. White hand-piece—are easily and cheaply altered to fit the Cone Journal Hand-piece.

PRICES.

Cone Journal Hand-Piece, with 1 doz. burs, - - -	$10 00
New Right Angles, with bur-lock, - - - - -	5 00

Wilkerson Dental Chair.

PATENTED NOV. 20, 1877.



PRICE, $175.

The cut is a good representation of this unique chair. The acknowledged requirements of a first-class dental chair have been here secured by Dr. M. B. Wilkerson—the inventor—by methods showing great originality. All cranks are dispensed with and levers substituted for them. The chair is raised by pressure of the foot on the long lever, which hides the back foot in the cut. This operation requires very little effort, and occupies but eight seconds, and is only equivalent to stepping up eight steps. To lower the chair one has only, with the toe of his boot, to raise the lever just back of that first named, and the chair sinks rapidly and noiselessly until the lever is dropped, when it instantly stops. Except when in use the long lever folds in under the chair.

A touch of the lever in front of that just named, leaves the chair free to rotate through the whole circle. Directly beneath the seat of the chair, and close to the seat, is shown a lever, which, when pressed forward, permits the rocking movement while the lever is held, but whenever released fastens the chair in position.

Thus the three principal movements, elevation, rocking and rotation, are accomplished. The minor movements, all of great importance, however, are the raising or lowering of the back of the chair; the raising in like manner of the head-rest; the slight rocking of the seat of the chair, so as to prevent the patient from sliding forward; the adjustment of the footstool at various lengths and heights; the spring back support to rest the small of the back. This, at will, is converted into a capital child's seat.

An arm-rest is shown at the right of the head-rest. It can be secured on either side of the head-rest at will.

The whole chair is of the most substantial construction and highly ornamental. It will be upholstered in either green or garnet plush or in leather.

This is *not* an hydraulic chair. It has *no pump*, but is raised simply and solely by a lever actuated by the foot. When raised, the elevation of the central column, which supports the chair, tends to produce a vacuum in the chamber through which it passes, and this chamber is immediately filled by a column of oil, which, opening a valve at the bottom of the chamber and directly following up the central column of the chair, blocks it up whenever the lever ceases to raise it higher. Of course, whenever the same valve is tripped, the oil flows back into its receptacle, and the chair is rapidly and noiselessly lowered. *Not one drop of oil* has ever or can ever find egress from the inner base of the chair to its exterior. So much to silence constant misrepresentations of another dealer.

ADVANTAGES.

1st. It can be raised with the foot of the operator, and by a very slight effort.

2d. It can be raised in half the time of any other dental chair, except the Morrison.

3d. It can be lowered without exertion of force, and as much or as little, or as fast or as slow, as desired, by merely opening a valve.

4th. Its range of movement is superior.

5th. It has a perfect forward and backward movement, so that the patient can be rapidly inclined at any angle by a very slight exertion of force by the hand.

6th. Its arrangement for children is unique and excellent.

7th. Its footstool is readily adapted to the wants of large or small persons.

8th. Its head-rest is completely firm in any position in which it may be placed, has a large range, and is fastened by a single movement of the hand.

9th. The operator can control all its movements without once taking his hand from the mouth of the patient.

10th. It has a perfect rotary movement.

11th. By means of an adjustable foot it will stand firmly on any floor, however uneven.

We have orders for a large number, and are receiving more daily, and entering them in rotation.

JOHNSTON BROS., 1260 Broadway, N. Y.

JOHNSTON BROTHERS & SELBY, 23 N. Charles Street, Baltimore, Md.

The Morrison Dental Chair.

Comfort for both Operator and Patient, Rapid Movement, Simplicity of Construction, Great Durability.

The desirable features of a dental chair are almost completely enumerated above. The Morrison Chair answers each of these requirements more completely than any other chair made.

It contributes to the ease of the operator:

1st. By the lightness and rapidity with which the patient is raised or lowered to a convenient position.

2nd. By the form of its back, which is so narrow as to render it unnecessary for the operator to stretch to reach his patient.

3d. By permitting him to drop either arm of the chair entirely out of his way.

4th. By making it possible to operate in either a standing or sitting posture with equal facility.

It affords comfort to the patient:

1st. In the arrangement by which the lower back-pad may be moved forward to support the small of the patient's back.

2nd. The upper back-pad is readily raised or lowered, so as to exactly adapt itself to the wishes of any patient as if the chair had been made for this one person.

3d. By the readiness with which the patient may change the foot-stool from one position to another as suits their notion at the moment, and without disturbing the operator.

If desired this chair can be furnished with either the usual upholstery of dental chairs, or with Turkish upholstery—soft and with springs; or with summer seats and back—of cane; or with separate sets of all of these, which can be changed from season to season by the owner without difficulty or the necessity of employing mechanics of any kind.

Its movements are very rapid.

It can be raised from its lowest position, in which the seat is 15 inches from the floor, to its highest, 42 inches above the floor, in seven seconds. Both low

and high based chairs are here combined in one, giving a vertical range of more than two feet.

It has no equal in operations upon Children.

The child can be raised as high as needed by the tallest operator.

It is provided with a comfortable back and head-rest, exactly as is a grown person.

The foot-stool is quickly adapted to children of any size.

It is extremely simple.

The principal movements of the chair and head-rest are all under control of but three clamps, and the chair is adjusted in height by a single crank.

By one of the above-mentioned clamps it is securely fastened at any desired inclination, and all done in an instant.

It is very durable, because

1. Being made almost entirely of metal, open joints or season cracks are impossible.

2. The upholstery of this chair is so arranged that it can be renewed, by exchange of the upholstered parts, without leaving the rooms of the operator and at moderate expense.

ACCESSORIES.

CASTORS.—To secure the *rotary movement* for such persons as desire it, legs have been cast, having recesses in the feet, into which Castors are inserted. The castors in the front legs roll laterally only, so that by them the patient's face may be turned to the light. When in the right position a locking device permits you to fasten the castors so that they cannot be moved until unlocked. The castors in the back feet are so placed as to revolve only back and forward, so that while they permit you to easily roll the chair like a wheelbarrow out of position if you wish to sweep, they cannot be moved by the force exerted in plugging a tooth.

NARROW BACK PAD.—To be used sometimes instead of the top pad, and sometimes as a third pad when the back of the chair is stretched to full length.

SPITTOON ATTACHMENT—see in the cut—is a cheap and convenient substitute for a separate spittoon. Is more convenient and costs less.

HEAD-REST.—The Morrison Head-Rest is a *thoroughly* good one, and has given general satisfaction. It is supplied with the chair if we are not otherwise directed, and the price of the chair as named includes this rest. The Johnston Head-Rest is *our latest*, and is everywhere approved. It can be had with the chair at an extra cost of $8.00. It is shown in the cuts.

EXTRA UPHOLSTERY.

Turkish Upholstery.

Some persons having desired a softer style of upholstery than is usual in dental chairs, we have adopted, after many experiments, a modification of what is usually known as the Turkish chair. The seat is made about four inches higher in front than at the back, and both it and the lower back are made very soft by the liberal use of steel springs and hair, the edges being kept full by a piece of heavy spring wire which is built into the upholstery.

The perpendicular edges are covered with a puffing to match, and "set off" with handsome silk cord.

The arms and upper back pads are made heavier than usual, and are puffed and corded to match the seat.

Real Morocco.

We also have produced a very elegant article by the use of real morocco, handsomely embossed. It is durable and particularly desirable for warm climates.

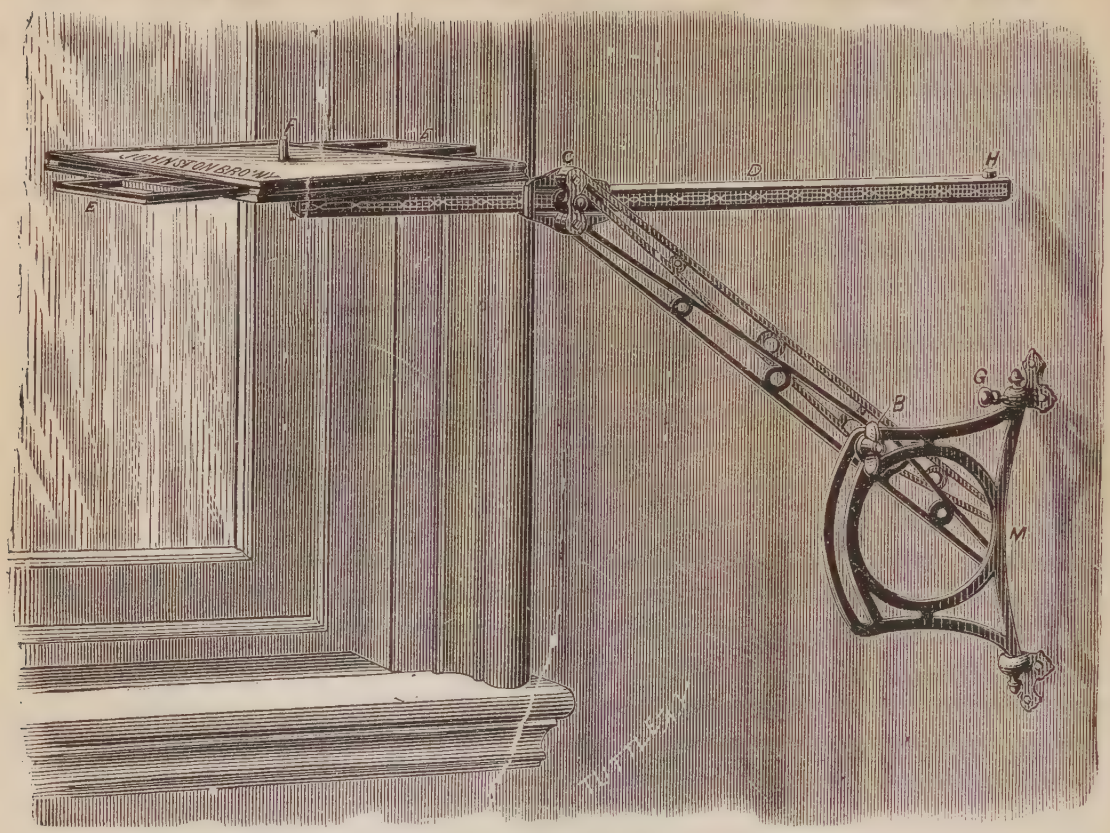
PRICES.

In fine green or garnet plush—with Morrison Head-rest	$ 150.00
Boxing	5.00
To which price add, if ordered:	
With Castors	10.00
With Johnston Head-rest, instead of Morrison	8.00
With extra back-pad	4.50
With spittoon attachment and porcelain cuspador	8.00
With nickled metallic cuspador and gold trap	10.00
With nickled metallic cuspador and gold trap, and nickled spittoon attachment	18.00
With Turkish upholstery	15.00
Real morocco embossed	10.00

JOHNSTON BROTHERS,

17 Broadway, cor. 32d St., N. Y.

MORRISON DENTAL BRACKET.



PRICES.

With Black Walnut Table, 12 inches square.....$25.00.
With Rosewood Table, 14 inches square, and Velvet Top, and Drawers about five-eighth inch deep, lined with Leather..... 40.00.
The Rosewood Table alone, as above, to fit any Morrison Bracket..... 17.00.
Boxing..... .....$1.00.

The cut represents the table in its highest position, and distant from the wall a little more than half the distance it is capable of taking. By loosening the thumb-screw B, and allowing it to rest in the bottom of the slot, (instead of at the top as represented here,) the table will occupy a position as much below M as it now does above the same point. The extreme range, that is, the distance between the table when at its highest and its lowest position, is 24 inches.

M represents a metal frame which is secured to the wall or other support by screws. It swings from side to side as a gate on its hinges. C. M. represent light but strong metallic arms, hinged at M as a centre and moving up or down. At B is a thumb-screw passing through a slot in the frame M. By it the arms can be firmly clamped at any desired height.

At C is a slide-rest through which the hollow rod D passes freely, and may be clamped at any distance from its ends. At one end of this bar a square table is supported, having in it foil and instrument drawers. This table is capable of rotation round F, which is the burner of an alcohol lamp, the alcohol being contained in D and introduced at its further extremity H. Among the advantages of this bracket are these:

1st. It combines a greater variety of range and movement than any other.
2d. It is rigid in whatever position it is clamped, and will hold 15 lbs. with steadiness.
3d. It provides a clean receptacle for foil and instruments.
4th. It is obvious that a square table is very much more convenient as an instrument stand than a round one.
5th. Its drawers extend through the table and can be opened from either side.
6th. To those having a Morrison Chair it is almost indispensable, as it will follow the chair to either its lowest or its highest position.

It is handsomely ornamented and nickel-plated throughout, so that it is a very beautiful addition to the furniture of the operating room.

JOHNSTON BROTHERS,

HARVARD UNIVERSITY.

DENTAL DEPARTMENT.

BOSTON, MASS., 1878-79.

The plan of study of this School has been radically changed. Instead of the usual oral examinations at the end of the course, written examinations are had at the end of each year on the subjects pursued during the year, and instead of the customary repetition each year of the lectures and studies of the preceding year, the course is progressive over a period of two years, and the student is required to pass a satisfactory examination in the first year studies before being allowed to proceed to the next. At the end of the course a satisfactory examination must have been passed in all the subjects.

The new year begins Sept. 25th, 1878, and ends the last Wednesday in June, 1879. It is divided into two equal terms, with a recess of one week at Christmas, and another in April.

The University Degree, D.M.D (*Dentariæ Medicinæ Doctor*), is conferred upon those who fulfill the requirements.

FEES.

There are no fees for matriculation, for the diploma, nor for the demonstrators. For the first year a student is a member of the school, the fee is $200; for the second year, $150; for any subsequent year, $50.

For information address,

THOS. H. CHANDLER, Dean,

222 TREMONT ST., BOSTON, MASS.

FRENCH CROWN AMALGAM.

The Manufacturer says of it: The Amalgam is composed of materials which the dental profession at large recognize as the best (except gold) for filling teeth. It is of finest quality. It has the merit of becoming hard in fifteen minutes after being prepared for use, and does not change color or shrink.

PRICES.

1 oz. box, with mercury	$3 00
⅔ oz. " " "	2 00
⅓ oz. in envelopes	1 00

For sale at wholesale and retail.

JOHNSTON BROS., 1260 Broadway, N. Y.

JOHNSTON BROTHERS' LAVA STRIPS.

PATENT APPLIED FOR.

For finishing fillings, a new and unequaled polishing material.

Thinner, more convenient and more efficient than corundum tape.

Price, per Box. ... .50 cts.

JOHNSTON BROS., 1260 Broadway, N. Y.

Ohio College of Dental Surgery,

COLLEGE STREET, CINCINNATI.

THE THIRTY-THIRD ANNUAL SESSION—1878-9.

Faculty.

JAMES TAYLOR, M. D., D. D. S.
Principles and Practice, and Dental Hygiene.

WM. CLENDENNIN, M. D.
Anatomy.

J. S. CASSIDY, M. D. D. D. S.
Chemistry and Materia Medica.

J. L. CILLEY, M. D.
Physiology and Histology.

A. O. RAWLS, D. D. S.
Pathology and Therapeutics.

H. A. SMITH, D. D. S,
Clinical Dentistry.

J. R. CLAYTON, D. D. S.
Mechanical Dentistry and Microscopy.

Special Professors:

F. H. REHWINKEL, M. D., D. D. S.
Oral Surgery.

G. W. KEELY, D. D. S.
Cause and Management of Irregularities of the Teeth.

C. I. KEELY, D. D. S.
Demonstrator of Operative Dentistry.

S. WARDELL, D. D. S.
Demonstrator of Carving Teeth.

FRANK BELL, D. D S
Demonstrator of Continuous Gum Work.

ALEX BROWN. D. D. S.
Assistant to Chair of Chemistry.

E. G. BETTY, D. D. S., Demonstrator of Anatomy.

Clinical Instructors:

DR. S. B. BROWN,
DR. F. A. HUNTER,
DR. A. W. SMITH,
DR. D. W. CLANCEY,
DR. J. E. CRAVENS,
DR. J. K. JAMISON,
DR. J. I. TAYLOR,
DR. F. PEABODY,
DR C. R. TAFT,
DR A. F. EMMINGER,
DR. W. S. HOW.

This institution being strictly a *Dental College*, the lectures in all the branches taught, Anatomy, Physiology, Pathology, Therapeutics, and Materia Medica included, are arranged with the view to qualify the student to intelligently and successfully practice his profession.

The College Building was designed, erected, and is exclusively used for a Dental School. The lecture and clinical rooms are therefore well adapted for the uses to which they are put.

Terms of Graduation:

A candidate for graduation must be twenty-one years of age. He must have attended two courses of lectures in a Dental or Medical College, the last of which must be in this institution. A reputable dentist in actual practice five years, inclusive of the term of pupilage, may be examined for the degree of D. D. S., after attending one full course of lectures.

Fees:

Matriculation Fee (but once)	$5 00
Professor's Tickets for one session	75 00
Demonstrator's Ticket (for Anatomy)	5 00
Diploma Fee	20 00

It is desirable that the students should matriculate and be in attendance promptly at the beginning of the term. The term begins the 1st of November, and continues sixteen weeks.

Students coming to the city should call on the Dean. Good board can be had for $3.00 to $5.00 per week. For further information, address

H. A. SMITH, DEAN,
286 RACE STREET, CINCINNATI.

New York College of Dentistry.

1878-79.

FACULTY.

FANEUIL D. WEISSE, M. D., Professor of Regional Anatomy and Oral Surgery.
FRANK ABBOTT, M. D., Professor of Operative Dentistry and Dental Therapeutics.
ALEX. W. STEIN, M. D., Professor of Visceral Anatomy, Physiology and Histology.
F. LEROY SATTERLEE, M. D., Ph. D., Professor of Chemistry, Materia Medica and Therapeutics.
J. BOND LITTIG, D. D. S., Professor of Mechanical Dentistry and Dental Metallurgy.

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JOHN ALLEN, D. D. S., Clinical Professor of Mechanical Dentistry.
JOHN T. METCALF, Clinical Professor of Operative Dentistry.
WM. T. LAROCHE, D. D. S., Clinical Professor of Operative Dentistry.
BERTRAND J. PERRY, D. D. S., Clinical Professor of Operative Dentistry.
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A. RUST CUYLER, D. D. S., Lecturer on Mechanical Dentistry.
C. F. W. BODECKER, D. D. S., Lecturer on Dental Histology.
EBEN M. FLAGG, D. D. S., Lecturer on Mechanical Dentistry.
JOHN SEYMOUR CLARK, M.D., Lecturer on Chemistry, Materia Medica and Therapeutics.

Demonstrators.	*Assistant Demonstrators.*
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A. RUST CUYLER, D.D.S.	GEORGE J. HARTUNG, D.D.S.
S. FRANK JOHNSON, D.D.S.	JULIUS M. STEBBINS, D.D.S.
GEORDE M. EDDY, D.D.S.	

Students may matriculate at any time, as the Infirmary is open for regular students of the College to practice in the entire year.

The regular course of Lectures will commence on Tuesday, October 1st, and continue until the latter part of February. Three hours of each day of the week (except Saturday) will be devoted to Lectures, and four hours to *Clinics*, and practice at the Chair and in the Laboratory, under the direction of the Demonstrators.

The Infirmary is furnished with twenty-four good chairs and all the appliances. The Lecture-room will seat, and the Laboratory accommodate, two hundred students; all on one floor, and up one flight of stairs only. There is seldom any lack of patients for students to operate upon.

Tickets for one year's Instruction, including Course of Lectures, Matriculation, Demonstrators', Diploma Fees, and practice in the Infirmary the seven and one-half months between the sessions	**$150.00**
For the Course of Lectures only	**100.00**
Matriculation	**5.00**
Graduation Fees	**30.00**

Board may be obtained for from $6 to $8 per week.

For further information, address

FRANK ABBOTT, M. D., Dean.
22 West Fortieth Street, New York.

PHILADELPHIA DENTAL COLLEGE,

Nos. 108 and 110 N. Tenth Street, above Arch.

FOURTEENTH ANNUAL SESSION, '77-'78.

FACULTY.

J. H. McQUILLEN, M.D., D.D.S., Professor of Physiology.
HARRISON ALLEN, M.D., Professor of Anatomy and Surgery.
D. D. SMITH, D.D.S., Professor of Mechanical Dentistry and Metallurgy.
S. B. HOWELL, M.D., Professor of Chemistry and Materia Medica.
T. C. STELLWAGEN, M.D., D.D.S., Prof. of Dental Pathology and Op. Dentistry.
EDWARD L. HEWITT, D.D.S., Demonstrator of Operative Dentistry.
ALONZO BOICE, D.D.S., Demonstrator of Mechanical Dentistry.
HENRY I. DORR, D.D.S., Demonstrator.

THE DISPENSARY and Laboratory open all the year.

Spring Course of Lectures will commence on the first Monday of April, and continue until the last of June. *Fall Preliminary Lectures*, commencing Monday, September 4th, will continue daily until November. Like the Spring Course, their object will be to anticipate subjects presented during the Winter Session. *The Regular Winter Course* commences Monday, November 6th, and closes on the last day of February ensuing. Three hours of each day will be devoted to attendance upon lectures, which will be illustrated to the fullest extent by a large and valuable collection of Chemical and Philosophical apparatus, and Anatomical and Pathological specimens. Tickets for the Course, including the Demonstrators', $100; Diploma, $30; Matriculation (paid but once), $5. For further particulars address

J. H. McQUILLEN, Dean. S. W. Cor. 21st and Arch Sts.

JOHNSTON ADJUSTABLE FOUNTAIN SPITTOON.

The defects of the Fountain Spittoons hitherto made are, that it is almost impossible to keep them from leaking, and that they occupy a rigid position close to the left of the chair, and hence prevent the operator from working on that side.

These defects will not be found in this spittoon, which is commended to the favor of Dentists by the following points of merit:

1st. It is readily adjustable to the position of the chair; that is, it can by an easy movement of the hand be raised or lowered to suit the height at which the chair is placed at the moment.

2d. The normal position of its base is, say, eighteen inches to the left side of the chair, from which position its basin will ordinarily be inclined towards the chair and patient; but should the operator desire to stand on that side of his patient, the standard of the spittoon can be instantly inclined in the opposite direction, so as to be entirely out of the way

3d. Instead of a wooden case, twelve inches square, is an ornamented metal tube one and a half inches in diameter, which will not warp, occupies very little room.

4th. Movable joints are so arranged that any leakage is impossible, since the waste from the bowl never comes to the joint itself, but is discharged below, in the bottom of the lower half of the socket of the globe, and conveyed into the waste pipes.

5th. It is provided with a gold trap, and an operator of good practice now using the ordinary spittoon will be able to save enough gold in from one to two years to entirely reimburse himself for this purchase.

6th. All its bright parts are of gun metal, and its tubing silk covered.

The water jet used is the device of Dr. Redman, of Louisville, Ky.

Price.....$60.00
Boxing.....2.00

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.

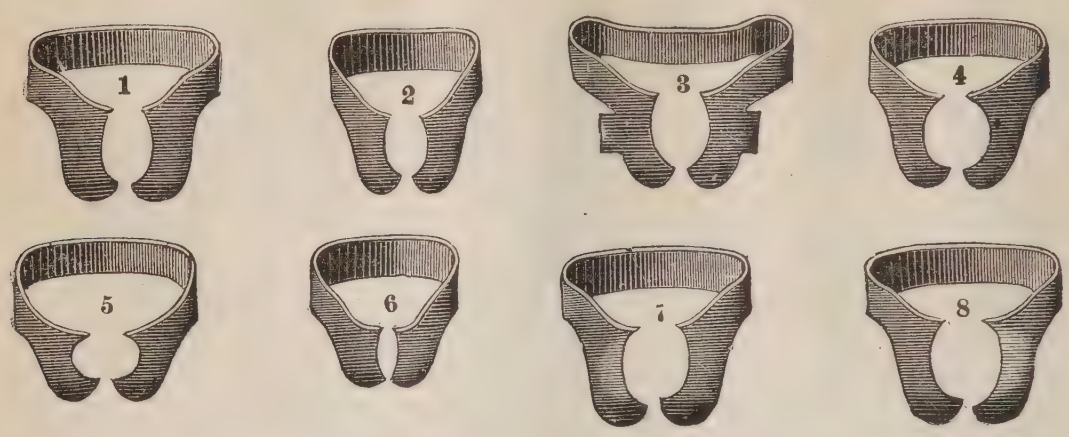
We were never more sure of doing signal service to the Dental Profession than now in offering the

IMPROVED

Rubber Dam Clamps,

INVENTION OF

DR. DELOS PALMER, OF NEW YORK.



Price, set of Eight, { Oil finish, $4.00. Each plain, 50 Cents
Nickel plated, 4.80. " Nickeled, 60

For use with Rubber Dam Clamp Forceps.

These Clamps are designed to be placed on the tooth at the commencement of the operation. Afterwards apply the Rubber Dam by passing it over both tooth and clamp.

DESCRIPTION.

Nos. 1 and 2.—Universal Clamp for Molars.

No. 3.—For posterior cavities in molars standing alone.

No. 4.—For third molars, or any molar of a cone shape. This Clamp can oftentimes be turned around while on the tooth, so as to place the bow of the Clamp out of the way of the operator.

No. 5.—For biscuspids.

No. 6.—For lateral and central incisors.

Nos. 7 and 8.—RIGHTS AND LEFTS.—For cavities under the gum, on the buccal or lingual surface of molars.

Cuts of two favorite styles of Rubber Dam Clamp Forceps will be found on another page.

These Clamps have prominent points of marked superiority over those of other manufacturers.

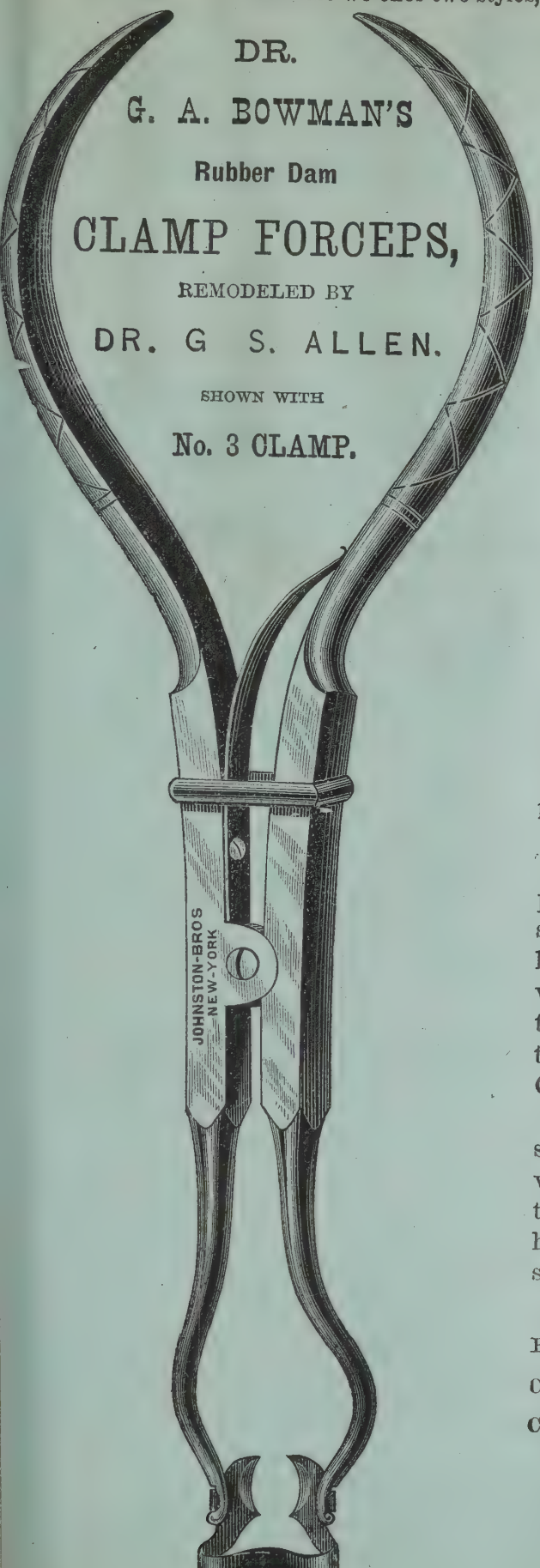
First. Each has been carefully adapted to the shape of the tooth for which it is designed, *under the personal supervision of Dr. Delos Palmer,* the inventor.

Second. A groove is made by us in the clamp, into which the forceps nicely fit, so that the clamps firmly hold their position on the forceps, when once adjusted, instead of tilting from one position to another—as is the case when no groove is provided.

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.

RUBBER DAM CLAMP FORCEPS.

Of these we offer two styles, both deservedly popular.



POINTS OF DR. T. C. ROYCE'S

Rubber Dam Clamp Forceps,

Shown with Clamp. Handles are exactly like the other style, (Bowman's.)

Both styles of these Forceps have points accurately adapted to the shape of the clamp at the neck, and hence will be found much more convenient than those hitherto offered the profession in this point of adaptation. (See also advertisement of Clamps.)

If so ordered we can supply either style of Forceps with a band, which will keep the Forceps and Clamp extended and ready for use when the hand of the operator is removed, as shown on the Bowman Forceps.

PRICES.

Forceps, either style	$3.00
" " " Nickel Plated	3.50
Complete set of Clamps, embracing eight forms	4.00
Complete set of Clamps, embracing eight forms, plated	4.80
Clamps, each	50
" plated	60

JOHNSTON BROS.
Broadway, cor. 32d St., N. Y.

1878.

JOHNSTONS'

Dental Miscellany

A MONTHLY JOURNAL

OF

AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL AND MECHANICAL LITERATURE.

Its Contributors are Eminent Writers and Practitioners.

It will contain Prize Essays upon the important improvements of the day.

It will contain illustrated articles from Dr. NORMAN W. KINGSLEY, on the treatment of Cleft Palate, Deformities of the mouth, Regulating of Teeth, &c.

The commendation of the Miscellany, received during the last year, has gratified its publishers greatly. They purpose to make the volume for 1878 superior in all respects to either volume that has preceded it. This will be—

1st. Through more frequent contributions from the regular writers who have hitherto favored it, and by promised essays from equally capable practitioners, who have not as yet written for its pages.

2d. By the further reproduction of engravings upon dental subjects. Three such have already appeared, and others are in course of preparation.

3d. By the constant search for, and publication of items of office practice, which serve to show the methods adopted by eminent and experienced dentists to overcome the little perplexities of every-day practice, and to shorten the operations in both laboratory and operating room.

4th. By the reproduction of matter of especial interest which may appear in foreign or comparatively inaccessible publications.

In short, it shall be the constant effort of the editor and publishers to make the DENTAL MISCELLANY of practical value to every actively employed dentist, as well as a source of literary enjoyment to its scientific readers.

TERMS OF SUBSCRIPTION—IN ADVANCE.

One Copy, one Year, postage prepaid, - - - - - - - *$2.50*

Single Numbers, - - - - - - - - - - - *.25*

PREMIUMS.

One-Half Ounce of "Premium" Gutta Percha Stopping, value, $2.50.

Or Colored Plate of Fifth Pair of Nerves,

Or Steel Plate of Evangeline,

Or Clapp's Saw Frame and two dozen Saws.

SPECIMEN COPY SENT FREE.

JOHNSTON BROS., PUBLISHERS,

1260 BROADWAY, NEW YORK.

Vol. 5. No. 56.

C. ASH & SON
3 SEP 78
LONDON

Johnstons'

Dental Miscellany,

A Monthly Journal of

AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL AND MECHANICAL LITERATURE.

August, 1878.

NEW YORK:
JOHNSTON BROTHERS,
1260 BROADWAY.

JOHNSTONS'

DENTAL MISCELLANY

FOR 1878.

It will be the aim of the publishers to not only maintain the character the MISCELLANY has acquired, but, by increased care, to make it more than ever an object of desire, if not a necessity, to every practitioner in the country. We have promises of articles from a number of dentists of national reputation, and do not doubt that the volume commenced with this number will be an improvement on either of the four which have preceeded it.

We invite contributions of practical articles from practical men.

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JOHNSTONS'

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THE ERRORS OF SCIENTIFIC LITERATURE—RELATING TO ARTIFICIAL VELA.

By A. C. Castle, M.D, New York.

Eye-witnesses shall write down what they know—and read it.—Athenian Laws.

The diffusion of a taste for literature and science, of late years, almost amounts to a phenomenon. The talents and attainments of eminent Professors, in every department of literature, in every branch of art, and in every scientific pursuit, are now called into vigorous and united action with well-directed zeal in establishing literary and scientific institutions. Nor has the literature of Dental Science been lagging in the race of unfolding the treasures of well-stored minds. With these facts before me, I may truly say, that no task is of more difficult accomplishment than that of correcting errors involved in the literature of a historical record, without giving offense to the author. Any such intention, on my part, is remote indeed. I write from the point I am speaking of, as noted by Bacon, that "he that delivereth knowledge, desireth to deliver it in such form as may be soonest believed, and not as easiest examined, in all probability will commit many errors."

It is with reluctance that I make objections to the "History of Artificial Vela, by N. W. Kingsley," published in the Dental Miscellany; I do so with the sentiment of what I regard to be due to any "*historical*" subject specially recorded, to wit, "fair play"—or, in other words, the

justice of sound professional ethics to those dentists of the United States —of whom there are several—who, in sequence of scientific progress, are entitled to their several places in Dr. Kingsley's Historical Statement of Artificial Vela, which he so largely *describes* and so *remarkably* illustrates.

I do not deem it necessary to treat Dr. Kingsley's serial *seriatim ;* but confine my remarks to the errors of *omission*, and those published on page 4, No. 49, Vol. v., where, the Dr. says : "Dr. Stearn's experiments mark '*a distinct epoch*' in the *history* of artificial vela, *not so much* from a *better* understanding of the *requirements* in such cases, nor from a *superiority in skill* in *adaptation* of an *apparatus* as from the *accidental* good fortune of having *brought to his notice* the *best substance* which has yet been discovered for this purpose." "It was," continues the writer, "in 1841 or 1842, that Dr. Stearn, *a young graduate in medicine, and* a native of Springfield, Mass., * * * became acquainted with Mr. Goodyear. * * * Dr. Stearn was afflicted with *congenital cleft palate*. He had been *twice* or *thrice* operated upon surgically, the fissure being confined almost exclusively to the soft palate ; but in each instance of staphyloraphy *proved a failure*, and his *only* hope of *benefit* lay in mechanism. *Being naturally* of an *ingenious mind*," &c. (if my memory is not treacherous, the Dental Miscellany not being before me), "he carved an *Artificial Vela* out of *Wood* for his own case," &c. The italicising is mine.

Dr. Kingsley *omits the early history* of artificial vela *in the United States*. The *first* artificial roof and palate was introduced into the United States by my father, in 1830, eleven or twelve years previous to Dr. Stearn's "distinct epoch." The instrument was made by me, in my father's office, under his direction. The case was one of most formidable character and proportions ; the whole of the soft palatine arch, with two-thirds of the palatine bones,—the roof of the mouth,—and the six front teeth with their alveoli, and portions of the spongy bones of the nose were deficient, presenting a terrible cavernous appearance ; these were complicated, with a double fissured "hare lip,"—the worst case I have ever met with, I first operated upon the lip ; I then made the "roof and palate," which my father adjusted in its place. Having made the instrument, my father allowed me to receive the credit of it.

The patient was so much pleased with the result that he visited the editorial bureau of the *Courier and Enquirer*, and submitted the instrument and its adjustment to the examination of James Watson Webb, and the late Mordecai M. Noah, editors, and the late James Gordon

Bennett, assistant editor, whose appreciation and approbation of it was editorially published in the next day's issue of their journal. This, and favorable mention in several others of the city press, induced Mr. Charles Stearn, of Springfield, Mass., to call at my office (1831), bringing his son with him—a lad about 14 years of age—for my advice in relation to supplying a similar instrument to remedy the defect of articulation and enunciation affecting his son's speech, &c., produced by a congenital fissure in the palatine arch.

Mr. Stearn informed me that "his boy" had been nearly a year under the professional treatment of the distinguished surgeon, Dr. Warren, of Boston—who, also, was *the* eminent specialist at that time treating congenital malformations of the palatine organs—"That in consequence of the highly nervous temperament of his boy, and the acute irritability of the palate, &c., after six months or more daily applying a feather, and harder instruments, with astringent 'hardening' gargles, to render the soft tissue of the velum, &c., obtuse to the presence of instruments used in operating, and uniting the opposite edges of the fissure, without the slightest advantage gained to this end, Dr. Warren relinquished the case."

Under these adverse circumstances, and the extreme youth of the lad, I advised Mr. Stearn to wait until his son had attained his complete growth of manhood, explaining that, until then, constant changes both in proportion and conformation of the parts would occur, which might require frequent alterations, and perchance one or two renewings up to the time that the organization was final, to admit a permanent artificial roof and palate. In brief, Mr. Stearn felt disposed to try the experiment. During the time I was employed making the instrument master Stearn occupied his leisure at my work-table, watching the various processes of preparing the moulds, making the models, and adapting and putting together the gold plate to the completion of the artificial roof and palate, and exhibiting his mechanical genius by making an excellent imitation one.

In 1832, Mr Stearn called upon me, and, "at the request" of his son, asked me to furnish him with duplicate models, &c., of the "case," as his son wished "to try and make one for himself." I acceded to his request, and in addition gave him duplicate models, moulds, &c., of the *first* mentioned case, with their sheet lead patterns of the gold plate adapted, and also the models, &c., of a third case I had made for Miss ——, of Litchfield, Conn., that he might observe how widely each case *differed* from the others.

Dr. Kingsley fails to do justice to Dr. Stearn in the premises. He had acquired his initiatory instruction in my office, from me, eleven years before he became a young graduate in medicine ; and if the knowledge of anatomy and physiology attained by "a young graduate in medicine"—with his blushing honors thick upon him—did not give him "greater superiority in skill in adaptation of an apparatus," I am at a total loss to conceive how, or in what manner, the "accidental good fortune" of having the "*substance*" of rubber *suggested* to him for making artificial vela establishes "a distinct epoch"—(beyond *that* of carving them out of wood) —characterizes "the scientific progress," &c., inasmuch that, for a very long time previous to this "accident" dentists in Great Britain had substituted and used rubber in place of gold, on account of its cheapness, &c., and who, in advertising it, *commended their* application of a "soft rubber palate" to the hard palatine arch as the *desideratum* achieved for fulfilling *all* its functions—not as here expressed, of a highly sensitive, nervous elastic, contractile, velvety, anatomical structure comprised in the complicated irritable organization of the *double-arched velum palatinum*, or soft palate.

From the time I made the artificial roof and palate for Master Stearn, in 1831, (when, at the same time, he received instructions from me regarding the rudimental principles of the science pertaining to these instruments, and I had furnished him with moulds, patterns, &c. 1832), he devoted his mind to obtaining the natural results of the functions of the palatine organs by these artificial means—with as much chance of succeeding had he attempted an artificial rubber eye-lid to substitute the *functions* of the natural one. "At last,," after years of disappointment, he discovered (a balm for his mental vexations) that he was not a whit behind the experience of the most scientific "operators" that ever failed in supplying the *vis nervosa*, or vitality to a slip of inert rubber for replacing the absent delicate perceptive nervo-muscular action and physiological functions of the soft, velvety "curtain" of the natural palate, attached to and in intimate relation with the tongue and pharynx. Disappointed and vexed at the failure of his fond dream, he transferred his apparatus, tools, instruments, material, moulds, etc., with his instructions and experience, to another, and relinquished the "science" forever. This *was*, and *so* it still remains, "the distinct epoch" of the scientific progress in the history of artificial vela.

The modern feature of an attached "flexible" (soft!) "rubber velum" to the hard palate is only of the slightest advantage in exceed-

ingly *exceptional* cases; and, apart from necessary frequent renewings, it is a thousand times counterbalanced by the necessity of constant attention to cleansing, or submitting to the collecting and adhering upon its surface (which never occurs to the natural velum) a viscid, offensive mucous, forming, as it were, a chronic catarrh. Rubber does not serve the scientific purpose of artificial roofs and palates as well as thin (No. 28 to 30 gauge), stronger, least obstructive, *durable* gold plate. The negative advantage the rubber "substance" offers is, it requires comparatively no skill in its mechanical manipulation; it demands less time, and is attended with less trouble in preparing it, and is of trifling expense.

Before taking leave of this interesting subject, I would beg to place before the profession—medical and dental—my experience of nearly fifty years, based upon practical experiment and application, enlarged by study, travel and observation.

The earliest efforts of modern applied skill devoted to constructing and adjusting artificial roofs and palates have marched step by step parallel with and *purely* upon the same principles governing the mechanism of supplying artificial substitutes for natural teeth, the intention of the first being *functional*, the latter *mechanical*. The success attending the *intention* of the former, replacing the functions of the deficient palatine organs, is very far from being commensurate with the time, ability, skill and patience applied to them wherever the attempt has been made. Not only is much knowledge required, with a true appreciation of the anatomical-chorographical, so to speak, relation of each and every part of the nasal-palato-pharyngeal regions, but the parts must be correctly moulded for perfectly adapting the instrument to the peculiarity and "requirements" of each individual case by whose aid it is sought to surmount the anatomical-vocal-congenital deficiencies.

It is noteworthy that very few of the operations of *Staphyloraphy* have afforded the slightest benefit in restoring the speech to its natural tone; and where the fissure has been confined to the soft *velum*, mechanism has succeeded no better. The success attending mechanism where surgery has failed is confined chiefly to those cases wherein the fissures have involved the palatine bones and the spongy nasal bones The aggregate success of adapted artificial roofs and palates presents about five per cent. that prove *satisfactory*, about ten per cent. admit of *partial* success, also satisfactory, and the remaining eighty-five per cent. may be accepted as *failures*. Of the latter, however, it is due to applied skill to state that not less than an average twenty per cent. of these failures are due to

"nervousness" of patients, mental obtuseness, obstinacy and impatience, and the incapacity of comprehending the meaning of the instrument, or the operation regarding its presence—that it is to be educated by the aid of and in combination with the living organization with which it is connected, as representing the deficient portion of the palatine structure in connection with the action of the tongue, pharynx, &c., for the purpose of producing the natural *timbre* of the voice—the peculiarity of voice or sound by which each individual is known and each musical instrument recognized.

Assuming, then, that a piece of mechanism is mathematically adjusted, the operator, to be rewarded with success for his skill, must not only be fortunate in the intelligence, but with the intellectually applied efforts of his client, who, with well directed vocal exercising, will avoid the nasal passages *behind* the palate by throwing the voice *forward*, along the lower surface of the artificial palate, well out of the mouth. This preliminary object attained, the speech may be perfected by intonation, or sounding the notes of the musical scale with the voice, by which the force of expression, articulation, and enunciation may be truly rendered by the *acquired* voice.

The uninitiated in this branch of "oral" mechanism must not allow themselves to confound the mechanical treatment of *congenital* deficiencies—the result of the mal-organization of the palatine structure—with the *lesions* of this region produced by *disease* and *traumatic* causes. The voice, attending the congenital mal-formation, never having been naturally formed, the combination of mechanism and art are necessary, and may *produce* it. The voice affected by the *loss* of the palatine organs from injuries or disease—previous to which it had been natural from the beginning—an "obsurator" supplying the *lost* portion of the palatine arch, *restores* the voice to its original natural intonation—as much so as well-adapted artificial teeth restores the process of mastication.

It is upon these traumatic lesions that the claim of success is chiefly based for mechanically remedying the congenital malformations. Such was the experience, with all the vexations and doubtful results, that obstructed his genius, destroyed his hope, and almost rendered nugatory his experiments and practice, that caused Dr. Stearn's ambition to succumb, and finally induced him to abandon all further interest in this direction of scientific pursuit. For the same reason—long since—I was satisfied to leave the problem of success to be solved by an "accidental distinct epoch in science," or to be dissolved by Dr. Stearn's successor.

In closing my remarks, I am free to say that no feeling of antagonism influences my pen beyond being mindful that "fiction pleases rather than the rigid truths of history;" and as there can be no pleasing fictions in science, I appreciate the scientific and literary intention of the DENTAL MISCELLANY, which rules that, while the subjects selected for publication from the collection of different foci—the results of the observations of many—are necessarily varied in character, they shall be of sufficient excellence, of becoming gravity, strictly didactic, and logically exact, and maintain a just bearing to all. Upon the principles of literary correctness—and an equal right to be heard, I ask the privilege and attention to my exceptions, based on the omissions and the errors embraced in the "History of Artificial Velva, by N. W. Kingsley."

MY EXPERIENCE WITH CHLOROFORM

BY T. S. HITCHCOCK, M.D.S.

I have read, with great interest, the articles in the DENTAL MISCELLANY on "The Poisons of the Intellect" Having some experience with chloroform and its wild intoxication, I would like to tell what I have thought I saw and heard. The writer of the article referred to, says one cannot remember what they have experienced while under the influence of chloroform. I have inhaled it over seventy times, for the purpose of producing an especial effect, *i. e.* trying to reproduce the scenes that were fixed upon my mind just before passing under its influence. I never have been able to do so in a single instance. Some thirty times the result has been the same—I see the same objects. The first is a large, rapidly running wheel, with many smaller ones inside its rim running in opposite directions, accompanied by a buzzing sound; then, in an instant, all is changed to squares with little discs revolving rapidly, and the outer line of the square fixed; then all is changed again, and invariably the same interior view of a room with three old people—the like of which I never saw nor read of. The room and its occupants all wear the same checkered appearance as in the last scene previous—then all gradually grows darker and darker, until the blackness of eternal night envelopes

the whole for an idefinite period—from five minutes to half an hour, or two hours, according to the amount inhaled. The sensation is not an agreeable one ; I get it about five times out of ten.

The next scene baffles all description. I see it but once in about ten times. It is a pompous show, a grand masquerade ; but instead of its being in a room it is on the highway, and all hurrying on in the same direction. I seem to be the lightest-footed of the whole company ; I bound along, not touching my feet to the ground except at long intervals. The scene is grand—original night and chaos wild. Their universal shouts and high applause fills me with riotous mirth, and on and on we go to night's Plutonian shore. Then it is I stand on the boundary of time. A dark impenetrable gulf seems before me. The roar of the moaning of lost souls appear to come up out of that blackness of darkness, and sensation looks to be swallowed up in the mad rushing descent into this maelstrom of unreality.

I had one very funny experience. It was one night, about 11 o'clock, I was trying its effects, and witnessing one of my grand pageants, and trooping along the gayest of the gay, when our fire-bells rang out the alarm of fire. It was a splendid addition to the already sublime spectacle. Every one seemed to enjoy the sudden increase of noise, and no one more than myself. It was like the sound of revelry by night, when Belgium's capital had gathered her beauty and her chivalry. The shouts and rattle on the street was only the noise of my own mad company. The clatter of voices and other sounds soon aroused me. What seemed to me to be hours, was only six minutes. The illusion of sight is experienced in chloroform anæsthesia, and somewhat similar to the French writer's description of hasheesh. Instead of his long shaded avenues, my object would be a post or column, which would recede for miles and look no larger than a nerve broach ; then it would come back, and be so large as to fill the whole vision. So it would go and come slowly.

When I first commenced its effects I could not remember what passed before my vision ; but, having observed the same things so many times, I distinctly recall them. I am satisfied all are not affected alike. Like those affected by intoxicating drinks, one is gay and another sad. As in my own case, distilled liquors have a depressing influence upon me, while in many others it is exhilarating. I receive no injurious results, that I am aware of, from these experiments. Can any one tell why I should see the same objects so many times ?

A CAUSE FOR DENTAL CARIES.

Read by C. FONES, D. D. S., before the Conn. Valley Dental Society, June 13, 1878.

If we were to consult the physiologist for the best method to develop a good physique in our children, his prescription would probably be, wholesome food, cleanliness and plenty of *exercise* in the open air. That the food should contain all of the elements for the proper nutrition of the whole body no one will deny. There are many theories advanced to account for the deterioration and decay of the teeth so prevalent in this country. Thermal changes, climate, the chemico-vital, chemico-parasitic, electro voltaic and chemical theories have all claimed our consideration, and it is generally admitted that the acids so frequently found in the mouth are the most active agents in causing caries of the teeth. It is also claimed by many that our food stuffs are deficient in inorganic matter, hence the degeneracy and decay of the teeth, but if we take into consideration that the human body contains only about three per cent. of this lime material (see *Boston Journal of Chemistry* for August, 1870,) we can see that it requires but a small amount of that element in our food for the proper nutrition of the oseous structure. Nearly everything we eat or drink contains a fair proportion of this bone making material. The fact that a considerable quantity of lime is being continually discharged with the saliva and urine ought to be sufficient proof that our food contains more of this material than is assimilated. If the pulp of a tooth is exposed and properly capped, at the end of two or three months we find a good resisting deposit of something very much resembling true dentine. Does not this tend to show that this inorganic element is present in the blood in sufficient quantity to meet any demand when it is really needed? We frequently see young people's teeth very much deteriorated, and at the same time an unusual deposit of lime in the shape of tartar on the teeth. If these teeth needed lime this condition would seem to indicate that the trouble was owing more to non-assimilation than to a lack of lime in the food. If the acids are the most destructive agents in decaying the teeth, then those teeth which contain a very large per cent. of lime are the most liable to be attacked by these agents. I believe it is very generally admitted that yellow teeth, or those which are said to contain more organic matter, resist caries better thanthe blue translucent teeth, or those which have

a larger per cent. of earthy matter. Leber and Rottenstinc, in their book on Dental Caries (page 73), take this view.

Prof. Wedl, in his "Pathology of the Teeth" (page 49), suggests that yellow teeth are the most durable, and their fibers are more uniformly disposed than those of the other class. One of our greatest medical philosophers (Prof. Jackson, of Philadelphia) deplores the marked tendency of the physical organization of woman on this continent to degenerate. Is it not reasonable to suppose that this weakening of the physical forces of the mothers of this country (thereby reducing the organic forces), has more to do with the congenital anomalies so often seen in the teeth, than the lack of a sufficient quantity of the lime element in blood. Are not the fissures, pigment spots, and other abortive conditions we see in these dentures, caused by a lack of nervous energy to properly sustain the organic forces in their effort to make a perfect denture. My own observation has been that these poorly formed teeth contain more lime and less organic matter than those which are well formed. Therefore, I am led to believe that the cause of these defective teeth is a weakening or letting down of the vital forces, thereby preventing the proper assimilation and organization of the inorganic substances.

It is an old maxim, that cleanliness is next to godliness. This applies with double force to the teeth, for a person who neglects this duty is not only offensive to the sight, but in some cases, where particles of animal and vegetable matter are allowed to decay between the teeth, the breath becomes infected to such an extent as to make the presence of such a person anything but desirable; and these unwashed teeth often become an intolerable nuisance. I believe that the benefits derived from thoroughly cleaning the teeth are two-fold: First, in removing foreign substances from between and around the teeth, the liability to the formation of acid is greatly lessened; second, the friction or irritation caused by brushing and rubbing stimulates the teeth and the tissues surrounding them to a more healthy assimilative action.

There are two pathological conditions for which the Americans are noted more than any other nation, viz: decayed teeth and dyspepsia. As mastication of the food is primary in the digestive process, it is of the utmost importance that it should be thoroughly done. One organ is so dependent upon a healthy condition of another, it is important that all (and the teeth especially, being the first concerned in the animal functions) should be in a perfectly healthy condition and perform their part

well. The food should be reduced to a state of minute subdivision. As the action of the digestive fluids are chemical in their nature, they will act more promptly and efficiently upon the food if finely divided than if swallowed in solid mass. A solvent fluid always acts more slowly upon a solid body than if the body be broken in minute particles, as the particles offer a larger surface to the contact of the fluids, and is more easily dissolved by it. Therefore, if the food be swallowed in solid mass, it must remain a long time in the stomach undigested and become a source of irritation and disease. These are facts too well known to need any further comment here, and in all probability the great prevalence of dyspepsia in this country is in no small degree owing to the habit of rapid eating to which we, as a nation, are addicted. Dickens and other foreigners who have visited this country have observed this habit. I have conversed with many Americans who have traveled in other countries, and they all agree that Europeans generally take more than double the time at their meals than is our habit in this country. Now, the teeth are created for the purpose of mastication, and their form and texture indicate that they are intended for the comminution of hard substances—a function they are rarely called upon to perform in these days, when much cooking and soft food seems to be all the demand. Therefore, I think I am safe in saying that the insufficient use of the teeth is a cause for dental caries. I can see no reason why teeth that are well formed should decay, and I believe they would not to any extent if they were properly used. We all recognize the law of development by proper functional activities. The gymnast and the hardy sons of toil, with their strong frames, hard muscles and calloused hands, are examples of the manner in which the tissues are made to assimilate the pabulum and bring them up to the point of resistance. If this is law in the other tissues of the body, why does it not hold good in the teeth? Are they not vital organs, furnished with vessels for an abundant supply of nutrition?

Prof. Hyrtle, the distinguished German anatomist, estimates the force exerted by the muscles of mastication in crushing a nut to be equal to four hundred pounds. Now, if we take into consideration the force that these muscles are capable of exerting, and that a solid piece of food (such as one would put in the mouth at one time) requires about thirty occlusions before it is in a proper condition for deglution, we get some idea of the activities of the dental organs when used in a proper manner. When we look into the mouths of our patients we often see the teeth on one

side presenting a smooth and resisting surface, and the tissues surrounding them in a perfectly healthy condition, while on the other side the conditions are quite the contrary. The patient informs us that all of the mastication is done on the healthy side. It may be said that the teeth are kept clean on the healthy side, and this accounts for the difference; but we sometimes see this condition when the patient is careful to keep all of the teeth clean; and if we have ever had occasion to operate on both sides of the mouth of such a patient at the same sitting, we have noticed a difference in the texture of the teeth; those on the unhealthy side appear soft and chalky, and we have little difficulty in cutting them with the chisel, while those on the opposite side have a better texture, are more resisting, and seem to have assimilated more nutriment than their diseased neighbors on the opposite side.

It is often asked why do we find such a large per cent. of the first molars decayed? The location of these teeth for the first three or four years (occupying about the same position as the third molar in the adult), the condition of the mouth for five or six years succeeding their eruption, the deciduous teeth being more or less carious and loose, also the fact that children, as a general rule, do not masticate their food to any extent—these conditions prevent a thorough use of the first molars, and I believe is a prolific cause for their premature decay. I have noted down a good many cases where I thought the insufficient use of the teeth was the cause for the pathological condition presented, and I thought perhaps it would not be out of place to mention a few at this time:—The Miss R———'s twins, named respectively Miss L——— and Miss J———, aged nineteen, sanguine temperament, good physique, great similarity in form and manners. Miss L. is a slow eater, taking about forty minutes at a meal. She has a full denture of thirty-two well-formed teeth, which contain only two fillings; Miss J. takes very little time at her meals. She has all the teeth excepting the six year molars, which are beyond redemption, and had to be removed. Her teeth appear to have been well formed, and resemble the sisters' in shape and color, but were badly decayed and contain fourteen fillings, some of them very large. She prefers soft food, not eating even the crust of bread, which she said caused her too much pain. The sister prefers hard food, or that which require much mastication.

Mrs. S., twenty-eight years of age, had a full upper denture except the right superior densepictie, the eight anterior teeth only remaining in the lower jaw, which, with the upper anterior teeth, were in good condition. The upper back teeth were badly decayed and quite soft. I filled these

teeth Sept., 1875, most of them with Hill's stopping, and inserted a partial lower plate; in April, 1877, I removed the temporary filling and filled permanently. The teeth and their surroundings were in good condition, the enamel being quite hard and resisting. Mr. F———, aged sixty, had, by the loss of the left inferior first molar, in early life acquired the habit of masticating entirely on the right side of the mouth. The teeth and surrounding tissues on this side were in excellent condition, but they were very much degenerated on the opposite side. Six years after this nearly all of the masticating teeth had been removed from this side, the teeth on right side remaining, and in good condition, excepting being somewhat worn. This gentleman was a rapid eater, but was remarkably fond of hard and coarse food.

Miss P———, whose teeth I had filled not quite a year previous, complained of her teeth being very sensitive. On examination, I found the teeth attacked in twelve different places with white caries. I filled with Hill's stopping, and advised the patient to give up her studies for a while, and to rub the teeth until the temperature was perceptibly elevated—to repeat this treatment two or three times a day. Said she could not leave college, as she expected to graduate the next term, but she would apply the napkin faithfully. I saw the patient ten months subsequent, and the teeth were in good condition; removed the Hill's stopping and filled with gold.

Mr. B———, a young man, complained of a tooth I had filled for him four or five days previous, being very sensitive to thermal changes. I advised him to rub the tooth thoroughly, which he did, and was entirely relieved in three or four days.

I suppose that cases similar to these are as familiar to the members of this Society as the faces of their most intimate friends. I do not pretend to have discovered anything new, and my only apology for reading this paper before the Society, is, that by observing facts similar to the above, and what reading I have done, I have become convinced that the insufficient use of the teeth is a cause for dental caries.

A. B. C.—THE TRANSLATOR. (?)

BY C. M. WRIGHT, D. D. S.

In the July number of the *Cosmos*, in the department headed Periscope, appears an article called "An American view of the Situa-

tion," and signed "Abstract from *Correspondenz Blatt für Zahnärtze*, by A. B. C." As I am the American named who is supposed to have viewed the situation, and as A. B. C. has recently been offering a number of abstracts and translations from foreign journals, through the pages of the *Cosmos*, I beg leave to state that, if in other abstracts A. B. C. has taken the liberties that he has in this case, he may be considered as perfectly unreliable, and unworthy of the honor of translating for a respectable journal. Several months ago I read the original article in the *Correspondenz Blatt*, signed by "Sch——," and must say that the author does not once stoop to the low attempts at personal bitterness, nor indulge once in flings at the American degree of D. D. S., nor at our American colleges. Therefore, great injustice has been done by A. B. C. to Herr Sch——, as well as to myself, in his pretended translation. The freedom of the translation, and the personalities indulged in by A. B. C., are unwarrantable and cowardly; for he shields himself under a pretended translation from the *Correspondenz Blatt*, and thus endeavors to put ironical and sarcastic insults upon my name, upon the title of D. D. S., and upon our American colleges, as having appeared in the article in the *Correspondenz Blatt*, when such is not the case at all. In the original article I am not once referred to as our D. D. S., or Herr D. D. S., &c., and the following evidences of bitterness are gratuitous on the part of A. B. C., viz: "Our D. D. S. is evidently a man of prodigous powers of observation;" "D. D. S., poor overworked possessor of a stupendous degree;" "We are not able to make ourselves believe that the maker of it has come to any greater wisdom than have our three-and-twenty-year doctors;" "We might, in passing, suggest to our Herr D. D. S. the propriety of sending his antediluvian drawing to Herr A. Welmer, to be used in his History of Students." This latter sentence is an entire corruption of the words, meaning and facts presented in the original. The others cannot be found in the original at all, either in words or tone. Then here is another *personality* not found in the original: "As regards the better system of education, that of America or that of Germany, we think a conclusion as to the matter might reasonably be allowed to rest with this Herr D. D. S. as an illustrative example."

Then to close the *Abstract* (?), A. B. C. indulges in the following, which, I state distinctly, cannot be found in words or spirit in the original article: "America has moved to the making of dental colleges; *she is flooding the land with jewelers, whom she deceives herself in designating doctors.*"

What can honest men and gentlemen think of such deliberate falsehoods, offered under the cover of a pretended translation. Herr is evidently a traitor in the camp—a coward, who hates with a high degree of bitterness the title D. D. S., as conferred by American colleges; who gnashes his teeth in secret fury at the American dental colleges, and yet who dares not offer his opinions over his own name; but who, when the least opportunity offers, rushes in under the shield of a *nom de plume* and a pretended abstract, to insult and sneer.

C. M. Wright, D. D. S.

TRANSPLANTING.

By G. R. Thomas, D.D.S., Detroit, Mich.

With me the operation of replanting teeth has become so common, and the results so uniformly satisfactory, that now I do not hesitate to extract any tooth in the mouth, if the case demands it; and I find the cases that demand it multiplying continually; not that the cases that demand it multiply, but the number of cases I have operated upon, and the observations made, have so strengthened my confidence, that wherein I was once *blind*, I now *see*; not with my mind's eye either; but with the visible eye, I see the end of the root or roots of nearly all my cases of abscessed teeth; and with a record of more than one hundred and fifty cases, with but one single loss, and that in the mouth of a man so timid that he utterly refused to bear the pain which nearly always follows for a few minutes, being compelled to re-extract it in a very short time, convinces me that the operation is not only practical, but decidedly beneficial to both patient and operator; for one sitting is all that I have ever really found necessary to the full and complete restoration of the case. But my object in this communication is not so much to speak of replanting as of transplanting, which I have reason to believe is just as practical, so far as the mere matter of reattachment is concerned, as in replanting; and I believe there are but two obstacles in the way of its perfect practicability. First, the difficulty of obtaining the proper teeth at the proper time, and second, the possibility of inoculation; and the latter I regard as by far the most formidable of the two, for I do not regard it as a necessity, that the tooth transplanted should correspond exactly in size and shape to the one extracted; if it is a little too large it may be carefully reduced, or if

too small, new osseous deposit will supply the deficiency. But in order to escape the ills that might follow from the second obstacle, I believe we should use the greatest caution. It is not necessary that the transplanted tooth should be a freshly extracted one.

Last winter Mr. N. C., a gentleman about thirty-five years of age, was under my care for the treatment of his teeth. His front teeth were, for the most part, very fine and conspicuous.

The right superior cuspidate had been filled some years previous, filling had been leaking, and having been neglected the crown had wasted away till nothing of the tooth remained when he came under my care save a large hollow root. I made an attempt to pivot, but found the shell too frail.

On the last day of February I extracted the root by means of the screw, and took a corresponding sound tooth that I had removed from a lady's mouth about the same age, just four weeks previous. In preparing for artificial teeth (it being the only sound tooth in the upper jaw it was thought best to remove it), I opened into the canal and pulp chamber from the apex of the root only, cut the end off one-eighth of an inch, it being that much too long ; reduced the size somewhat in the center of the root, it being a trifle larger than the root extracted ; filled and placed in position.

The occlusion, shape and color, were perfect, so much so that several dentists who saw the case within a few weeks after the operation, and being told that it was one of the superior six front teeth, and requested to point it out were unable to do so ; among whom were Prof. Watling, of Ann Arbor, and Dr. Haskell, of Chicago, who made the remark "It was well worth coming from Chicago on purpose to see." Perhaps some one is ready to say "it being pulpless it certainly must be discolored." I think such a one would be surprised to see the life-like appearance that this tooth retained, and I think the reason is obvious. When we, or nature, through neglect produce death of the pulp in the ordinary way the fluids of the tooth are immediately changed in color, not only from the effect of the poison that may have been used for the purpose of devitalization, but from the leakage that I believe always takes place into the tooth, through the foramen at the apex, after filling the pulp-chamber and root canal when the tooth is contained in the socket. I have had occasion to examine the roots of a great many teeth that have been filled, to the apices as has been claimed by those who have a reputation equal to any in the land. But I have never yet found one that was filled tho-

roughly to the apex I have occasionally seen one where there was some filling at the apex, and even through the apex, but when opened up and examined it would come far short of a perfect filling. And I believe the imperfect treatment of this apex the point of prolonged trouble in the treatment of abscessed teeth ; and this is the advantage gained in the replanting operation ; the apex is thoroughly filled, leaving no opportunity for the operation of poisonous gases, therefore my opinion is, that if it is found advisable to devitalize, extraction, filling both crown and apex, and replanting is by far the most successful and satisfactory mode of treatment. The perfect filling of the root explains I think the reason why the transplanted tooth has not changed color. In cases where replanting is demanded, except those of immediate destruction of the pulp for the cure of abscess, etc., we invariably find the tooth already discolored.

The two features I wish to make prominent in this case are, that notwithstanding the fact that the tooth was four weeks in my office, there is no perceptible change in the color, and the reattachment is as perfect as though it had been transplanted the same day of extraction.

It has now been three months since the operation, and the patient informs me that he has known no difference between it and any of his other teeth since the first four weeks.—*Dental Register.*

[Note. We take pleasure in bringing to the notice of our readers whatever is written on this interesting subject, but cannot forbear reference at the same time to the remarks of the late Dr. Barker, of Philadelphia, on this subject. He had considerable success in replanting ; but one case of tetanus led him to abandon the operation thereafter. We heard his experience recited (at a meeting of the New York Odontological Society, we think), but do not know whether it was ever put in type.—Ed.]

AMERICAN ENTERPRISE IN BRAZIL.—THE NEW STEAMER CITY OF RIO DE JANEIRO.

By Dr. L. R. Ebert, of Rio de Janeiro.

It certainly gives one pleasure to have the United States and Brazils once more united by a line of mail steamers. The want had long been felt. It is high time that American industry should take a firm footing in Brazil, there being vast fields yet to be explored by agricultural, mechanical, engineering and professional men. To gain this is very diffi-

cult, owing first to all sorts of obstacles placed in the way of strangers—they are not at all encouraged ; secondly, to the low state of the State Treasury, and a commercial crisis through which the country is passing; and, thirdly, to meet certain exigencies, the Government has adopted a course of economy which crushes for the time all hopes of aid from the ministry, and baffles all endeavors at new industries for bettering the present condition of the country.

The rapidity of the construction of the steamer City of Rio Janeiro, and the comfort and elegance of its appointments, caused some surprise. As the *Cruzeiro* (the liberal organ here) says : " Apart from the comfort " and hygienique dispositions that are offered to the passengers, is to be " remarked the solidity of its build, perfection of its machinery, and the " precautions taken in case of danger. The interior decorations are of " severe taste, free from the profuse display of gilded ornaments found " generally in vessels of that class ; but in compensation is to be noted " the artistic combination of the various woods that enter in the orna- " mentation of the saloons and cabins, such as satin wood, maple, ma- " hogany and walnut "

The arrival of the City of Rio de Janeiro, on the morning of the 29th of May, made every American heart in Rio beat with pleasure. To us it was a satisfaction to listen to the exclamations of surprise and admiration proferred by Brazilian visitors of note, and who were able judges, at their visit of welcome on the arrival of the noble steamer.

If I mistake not, there is an idea prevalent in the States that foreigners are well received here, and that one has only to come to Rio, stoop and reap enormous profits or amass easily a fortune. It is not so ; for here, as in all countries, one has to toil and struggle at first ; and if a feeling of dislike is shown to foreigners, it is due not to jealousy only, but to their having been often meanly cheated, and sometimes, I am sorry to say, by American Companies. There is a lack of confidence, and it must be restored before justice is done us as a nation. Again the *Cruzeiro* expresses itself in the following terms : " The American people, like all " all other people, have many good qualities and many faults, but indi- " vidually it is easy to discover in them vices. As a mass they have at- " tained wonderful power, and, in the space of one century, obtained " in the fields of civilization and progress, conquests and advantages that " older nations have not as yet been able to obtain."

Notwithstanding, American goods sell well, and may be said to be in demand ; and I feel sure that this new means of intercourse will give a

new impetus to American merchants, and open a new era in their commercial relations with Brazil. Speaking of American enterprise, a new industry has lately been opened in Rio, a cotton hose and undershirt steam factory (the only one of the kind in the Empire) by two American gentlemen, and the prospect is now fair of a perfect success.

In our dentistry American influence has also begun to be felt and a good deal of progress made towards the elevation of our profession. Ten to fifteen years ago dentists and their operations were not much thought of and a total indifference was shown about teeth. To most it mattered not whether the teeth were filled or extracted, and many teeth were sacrificed that could have been saved. There is not a city where, in proportion to its inhabitants, so many decayed teeth are seen or in greater part filled carelessly with amalgam fillings that are half dropping out. I have seen fair faces destroyed by one smile. Either all front teeth were decayed or blackened by amalgam. To-day a change is felt due to the influence of able operators from American dental colleges who take pains to instruct their patients, and the people begin to pay more attention to their teeth, have those unsightly fillings removed, alveolar abscesses treated, roots extracted, have gold fillings inserted and understand the necessity of having their mouths in good order; they appreciate operators placing the profession on a higher pedestal than before, and charlatanism can no longer have its sway or live in Rio. Still, to show how many are indifferent, in comparison to residents of American cities, Rio, with a population of 300,000, has not one hundred dentists, and of that number, twelve I think, only are Americans. Though all are doing well, one feels that that number is great enough. By saying this, I do not wish to discourage or influence any operator who has a desire to come to Rio. It is to chase away all illusions as to making rapid fortune. On the contrary, the more we are the more influence we have. Dental goods, also of American manufacture, have the preference, and nearly all the gold foil is of American make. To-day all operators select American instruments and the people fully admit our superiority.

University of Pennsylvania—Dental Department.—Members of the Profession having Specimens of Peculiarities of Development or unusual Pathological Conditions, Models of Irregularities as to position in the Natural Teeth, etc., etc., who will be good enough to send the same by mail, or otherwise, to Professor E. T. Darby, 1513 Walnut Street, Philadelphia, Pa., will receive suitable acknowledgment and thanks for the same, and the specimens will be nicely mounted, with the donor's name attached, and deposited in the College Museum

THE BROOKLYN DENTAL SOCIETY, REGULAR MONTHLY MEETING, FEB. 11, 1878.

Incidents of Office Practice.

Continued from page 278.

Dr. Fry: Some three years ago this question was up, and I heard one gentleman express himself that he did not believe there ever was a pulp saved after it had been punctured and bled. Three days after I was cleaning out a cavity in a bicuspid, and I accidentally wounded the pulp, and, to my horror, drew blood—a real ooze of blood—through the dentine. I felt very badly. I always use the rubber dam, and I am very careful to keep the cavity dry. After wiping out the blood as well as I could, I applied chloride of zinc. It seemed to change the blood a little; it changed the color and seemed to make it lighter. I then used warm air to dry out the cavity. There was some considerable sensation, but I was gentle with it. I then took a chloroform solution of Canada balsam; with great fear and misgiving I put the solution in there, then dried that, and then I circumscribed the cavity with it. I gave two or three coats near the trouble. Then I put in a little circular disk of paper—fine paper that had been soaked in this Canada balsam—and dried the whole of it. I filled the tooth with gold, and made the first record that I ever made. That was a little over two years ago, I think. I have seen the lady since three times, and I have searched very carefully with my magnifier for any indication of trouble in the tooth, and I am very much pleased to say the operation was a success. The pulp may be dead, but it has given no trouble. The filling is beautifully done, for I did it myself.

Dr. Crandell: This is a subject that is often before our society for discussion, and one always very interesting to me, and during the discussion this evening one thought has occurred to me something like this: the vast importance, the great value that we, as a profession, should derive from a careful record of all our operations, especially in cases of exposed pulp—in attempting to save them alive—in cases where we devitalize—of exposed pulp when inflamed and congested. If we recorded where we have failures, if we recorded where we have periostitis and alveolar abscess, and where we devitalize, after a few years a careful

tabulation of results would afford us most valuable and reliable data from which some definite calculations might be made, enabling us to determine the percentage of failures in any given class of operations as well as the measure of success attained. As Dr. Jarvie has remarked, I like to hear gentlemen say what they do in every day practice, not what they think might or ought to be done.

Doctors are expected to disagree, and dentists too; we have many among us who are radical, and that is very good. They are the men whom we like to listen to. So far as my own practice is concerned, I may be considered quite a radical, and my practice is not as extensive as that of many gentlemen present.

I was reminded, a few days ago, of the wonderful elasticity of nature in the case of two lower molars, second and third, filled nine years ago with what I supposed to be Townsend's amalgam, filled on the pulps. These pulps were dead. I had occasion to remove the filling, which I did very carefully, feeling my way. The lady assured me that she had had no trouble. They had been very comfortable and serviceable. I thought to myself, here is a case of many years standing and no trouble. I might open into this charnel house, but as the case has gone on in this condition, I will let well enough alone. It is time enough to meddle when it is necessary—when it is indicated by trouble and pain. I filled very carefully. I found what seemed to be a vitrified condition of what I supposed to be disintegrated dentine all around the pulp, around the margin of the exposure. I found it very hard. In this same individual, the second molar on the opposite side of the mouth was devitalized by a member of the society, and filled. That tooth about nine months ago gave serious trouble, alveolar abscess supervened, and I had considerable trouble with it. I try to get at the truth, and I want to take the best possible care of my patients, and I think we should be ambitious to do this; and what we should aim at is to get at the facts, that we may give our patients the benefit of the best possibilities. That is the reason I talk. We may talk very profitably of our failures. They may be very largely due to the want of delicate handling. We must be very attentive, and it is a matter about which we must exercise judgment.

Dr. Mills: Dr Cook said we don't stand where we did ten years ago. Dr. Hawes will remember some five or ten years ago—I can't tell how long ago—it was in the time of the old Association, a certain gentleman made a motion that we do not consider it a safe practice to undertake the capping of pulps. That was the

purport of it, and I raised my voice against it; and I made the remark, that we should hesitate to pass such a resolution, because it might prove as another resolution did in regard to the wholesale extraction of teeth. It is evident that there are a great many who are saving pulps to-night who did not do it ten years ago. I have had men tell me that I have said that I never destroyed a pulp. I did not say so, and I did not mean so. I say that in the last seven or eight years I have not purposely destroyed a pulp, and I did not have anything in my office with which to destroy it. I make an effort with every pulp to save it alive. That I do always save it, I don't pretend.

Dr. Cook: If the patient is suffering pain constantly, and, with all the treatment you adopt the tooth still aches and aches, what would you do?

Dr. Mills; I don't know that I have any such cases. Dr. Chapman asked some years ago, why pulp tissue is not as amenable to treatment as other tissue is? I could not answer the question. My amount of success encourages me to make the effort in the line I speak of; and I have nothing in my office to destroy pulps with. I am glad to hear Dr. Crandell say what he does; I think the time will come when a good many men will show an advance. As to the matter of treating pulps—I have but a few exposed pulps. As Dr. Mirick says, I go on and treat the cases which present themselves without any anxiety.

Dr. Hawes: What objection is there to destroying the pulp when it is badly congested, and you can get no relief by any treatment you adopt?

Dr. Mills: I can't recollect a case that I was unable to relieve.

Dr. Brockway: The hour is late, and yet I don't feel that I can sit still. It is not an unpardonable sin to destroy a pulp, in my judgment, although I admit it is better to save a pulp alive for the additional strength which the tooth has, and, in the front teeth, the other advantage of the better color which is preserved. But the management of exposed pulps in my practice has become in the past few years a simpler matter than it formerly was, and I adopt a method different in some respects, at least, from any I have heard mentioned. I have not purposely destroyed a pulp in more than three instances within the past year. I would destroy a pulp without any hesitation in a case where the difficulty of saving it alive and the chances of ultimate success were great. Sometimes the game is not worth the powder. If we have a case presented

where the pulp is badly congested, and still more, if part of the pulp is lost by sloughing, I should not hesitate to destroy it, because I conceive the disadvantage in destroying the pulp would be slight compared with the trouble that would be requisite to preserve it alive. When a pulp is nearly exposed without congestion, my practice is to disinfect it with creosote, usually wood creosote, sometimes coal tar creosote, and then cover the surface with Fletcher's cementum. After laying that on in a little cavity cap—those prepared by Weston are very convenient—it will soon harden sufficiently to admit of filling upon it with oxychloride of zinc or Hill's stopping or amalgam, as the case may be. I should hardly venture to fill such a cavity with gold at once. I have, as I said, practiced this method for nearly two years. I don't know of a single case where the pulp has died or has given subsequent trouble. Perfectly exposed pulps are not common, but pulps nearly exposed are more common, vastly more. I formerly practiced the method of coating the surface with Canada balsam, and I had good success with it, but fashions change, and I got in the habit of using non-irritating cement, and it has proved so satisfactory that I am well satisfied to continue it.

Dr. Mirick: I want simply to state a case that we will all recognize, and that is of a young lady complaining of passing several sleepless nights with pain. She could not locate it. On examining the teeth, I found two upper bicuspids that had been filled with amalgam for some four years. The filling was solid and firm. I rapped on all the teeth and found, that the first bicuspid was slightly sore. I drilled all around the amalgam filling, and then lifted it out, and when it started she gave a jump out of the chair. Then the blood came freely into the cavity. I would like to ask Dr. Mills whether he could save that pulp?

Dr. Mills: I can not tell. But the evidence is very strong that it is a very badly congested pulp. I don't know what I would do. I would diagnose the case as I went along. I would remove it if it was congested all the way through.

Dr. Hawes: What objection would there be to applying a little arsenic and destroying it?

Dr. Mills: My effort would be to save a little of the pulp.

Dr. Hawes: You are averse to using arsenic, and can't tell why. You say, if the pulp was congested all through, I want to know if the end congested is not alive?

Dr. Mills: Of course it is alive; it is a different degree of life. You

know there is such a thing as a pulp congested at one end. If any man has any doubt of that, I think I can bring testimony that will prove it conclusively.

Dr. Hawes: I said it was my opinion that forty-nine out of fifty would think it best to destroy the pulp in the case Dr. Brockway speaks of. I would ask again what objection there would be to destroy it by applying a little arsenic?

Dr. Mills: That pulp might be so congested, that I might think it past all effort, and I might simply remove it. I would not put any arsenic there, I would not find the necessity for it. I have seen pulps so badly congested that there was very little feeling.

Dr. Hawes: What is the objection to arsenic?

Dr. Mills: I don't see the necessity for it.

Dr. Chapman: If that pulp had sufficient vitality to need to be devitalized, there are some hopes for it.

Dr. Jarvie: Dr. Mills made a remark that he was glad to see this time, it showed progress. I feel the reverse is true; I don't think it shows any sign of progress at all.

Dr. Mills: You are mistaken—it shows progress in the effort to save pulps.

Dr. Jarvie: I don't think that is so. In the last ten years, there has been a continual attempt to save pulps, and, in that ten years our experience ought to be worth something—it ought to tell us, with some degree of certainty, what class of pulps we are likely to save and what we are not likely to save; and, where the chances are against the saving of the pulp, we had better devitalize and treat—when we are certain of no further trouble—rather than wait until abscess forms, when it is impossible to save the tooth. In that class of cases, I think it is easier to destroy the pulp than to wait. That is the point of my remarks in regard to the difference in treating the various classes of teeth.

Dr. Crandell: For myself I may say I always try to save all exposed pulps. I believe I have not dressed a tooth with a view of destroying the life of the pulp in five years. That I have succeeded in my efforts in all cases I do not say. We all have our "funerals," I suppose. I have been so fortunate as not to have had those extremely bad cases referred to by Dr. Brockway and others. I have used the Canada balsam some years, sometimes applying several coats over the exposed portions of pulp, regarding the anæsthetic effects of the chloroform upon the pulp tissue as valuable. I have never allowed oxy-

chloride of zinc to come in contact with a pulp. I have no doubt we are all earnest seekers after truth, but I sometimes feel that little is established as truth; perhaps I am skeptical. I think we might very profitably discuss the causes of our failures in attempting to save exposed pulps. I should feel culpable, indeed, if I had had "supreme control of my patient" from early childhood, and allowed any pulp to become exposed. I hope we may have reliable statistics gathered from the practice and experience of earnest men to assist us in our estimates of methods and principles.

Dr. Scott: Many of you know that I don't believe that the pulp of a tooth can be restored to health after it has ached, or been exposed for ten days. I say in my practice it is very uncertain. I am not as successful as many of my fellow dentists report. I think, perhaps, if your patients were the judges they could tell of the sufferings they endured after you had capped the pulp with os artificial. I am very sure that the pulps of two-thirds of all teeth that you cap are dead within six weeks after capping. I have taken out many fillings and many teeth after they had been treated for the preservation of the pulp alive. I think if the pulps of those teeth had been taken out and properly filled every one could have been saved. I know that many of my brother dentists will criticise me for saying what I do, but that will not make any difference in my experience. What is expected here is for every one to give his failures as well as his successes; but I find all are successful except Scott. I have filled many teeth after the pulps had been exposed, and hundreds never gave any trouble, but after many days they would show that the pulps were dead, and many I have refilled. I think os artificial is very good to destroy pulps. I often fill teeth with it when I know the pulp is exposed, and quite often it will give no trouble, but you can bet your bottom dollar that in less than six weeks the pulp is dead. I have heard dentists in our meetings say it was wrong to destroy pulps, as they were always successful in saving them alive. I could have told these same gentlemen of failures in their own practice at the time, but I had not the courage to do so.

Adjourned.

SUPPURATIVE INFLAMMATION OF THE GUMS AND ABSORPTION OF THE GUMS AND ALVEOLA PROCESS.

Read before the American Academy of Dental Surgery, New York, Oct. 20th, 1875.

By John W. Riggs, F.A.A.D.S., Hartford, Ct.

This disease is called by many the disease of old age, as formerly it was more particularly noticed in persons of advanced years, but at the present day we find the middle-aged, and even the young, affected by it. Many of the text-books of our specialty consider it hereditary, or constitutional, or bone disease, arising from a scrofulous diathesis. The result, from whatever cause, is most disastrous to the teeth, and in many cases to the health of the patient, for one by one the teeth become loose from loss of bony support, and are plucked out as an intolerable annoyance. If the inflammatory action be great and involve most or all the gum embracing the teeth, pus tinged with blood exudes from around the necks of the teeth on the slightest pressure of the lips or tongue, or in mastication. The oral secretions become vitiated, present a viscid or sanious character, very abundant in quantity during the day, but much more so in the recumbent position of sleep. If the patient reposes on his side these exudations flow out of the corner of the mouth over the pillow and present in the morning a dried, yellow discoloration, often tinged with blood and covering a space as large as one's hand. If the patient reclines on his back the diseased mass flows back into the fauces and is unconsciously swallowed, there to work a greater mischief by breaking down the tone of the stomach and poisoning its contents. I apprehend there can be little question or dispute among physicians or physiologists as to the deleterious effect of this putrefactive ferment on the digestive organs. Indeed, of the many intelligent practitioners the writer has met only one who maintained that these purulent exudations were harmless, yea, absolutely nutritious ; that the gastric juice transmuted every noxious characteristic into healthy pabulum of the blood.

Notwithstanding this single opinion, the diagnosis of a number of cases for treatment fully sustains us in the former conclusions, confirmed, as they are, in every instance by the rapid recovery of the *general* health of the patients by restoring the *particular* health of the mouth.

None but the most vigorous constitutions can withstand this type of the disease. The appetite begins to fail ; even the odor of cooking the

most savory food is offensive. A cup or two of strong coffee, and a few crackers, constitute the sole breakfast ; languor and ennui are substituted for cheerfulness and vigor of mind and body ; neuralgic pains sweep up through the face to both hemispheres of the brain, and are intensified by a recumbent position, thus banishing sleep. The patient paces his room at night, or reclines as well as he may, until in his agony he cries out, as Macbeth to his physician, "Canst thou not minister to a mind diseased? Pluck from the memory a rooted sorrow? Raze out the written troubles of the brain, and, with some sweet oblivious antidote, cleanse the stuffed bosom of that perilous stuff which weighs upon the heart?"

The disease also aggravates, if it does not cause nasal catarrh. One of my patients, a physician, the best authority, of course, strenuously maintains that the restoration of his gums, teeth and mouth, to health, relieved him entirely of a violent catarrh, upon which he had exhausted all known remedial agents.

One patient, besides great prostration from aggravated symptoms, became nearly blind. She could not see to read ordinary print, and could only tell the number of windows in a room by the mass of light from each. She could not walk up a flight of steps without assistance. I had the pleasure, some three years ago, of presenting this patient for examination before that very enthusiastic society of workers, the Brooklyn Dental Association. She was then well, sufficiently so to walk several miles daily. Gums and mouth healthy ; appetite good, and fast improving in general condition. As this disease exists in a less annoying and less dangerous form for several years previous to the above aggravated symptoms, covering from ten to twenty years before it culminates in its miserable characteristic, the loss of the teeth or life, I have thought best to tabulate its progress by treating it under four heads or divisions, as follows :

First. Where the margin of the gums shows decided inflammatory action, with some absorption of its substance, and bleeding at the slightest touch of the brush.

Second stage. Where the inflammation extends down over the thinner olveolar border, causing absorption of the bone, as well as gum tissue, forming small pockets beneath the gum filled with pus.

Third. Where the diseased action takes deeper hold, involving the thicker portions of the process, absorbing it most rapidly nearest the tooth, causing the tooth to sway back and forth for lack of most of its bony support.

Fourth and last stage. Where the disease has swept away all the alveoli

and much of the gum, the tooth being held in place by the conversion of the peridental membrane at the apex of the root into a tough ligamentous attachment.

The first and second stage is seldom noticed—only when it has reached the third stage does it challenge the attention of the practitioner ; then to be treated by astringent washes or syptic tooth powders, or by the more heroic treatment of slitting the gums between the teeth, down to the bone, with a thin thumb lancet, only to relieve the turgid gums temporarily by copious bleeding. The patient is informed that he has scurvy of the gums, or bone disease, or old age disease, though the subject be not thirty years of age ; or that the disease is hereditary or constitutional ; or the patient is of a scrofulous diathesis.

So much for the old pathology and treatment. What saith the new ? I plead a general denial of the old pathology and treatment, and offer the following point in proof of its falsity.

Present the worst case possible, one of those described in the first pages of this paper, and it shall make full and complete answer. Extract every tooth in said case and the patient will rapidly recover his health ; his jaws and gums will immediately show an improved appearance ; the gum tissue will change from a dark red and swollen condition to a light pink and healthy color, and the whole mouth in due time will present as healthy a base for an artificial denture as was ever seen. Now, if it is a born disease, or hereditary, this sudden loss of the teeth should work no cure, but the disease should and would march straight forward until all the processes of both jaws were annihilated, if so be the patient lived so long. Not so, however. The teeth being lost, the disease is arrested, active and suppurative inflammation and absorption of the parts subside into a curative and healthy action. New bone cells are deposited into the remaining alveoli until the apex or ridge of the jaw is rounded over and health reigns where a disgusting and wasting disease lately committed its ravages, and what is more and better, health, vigor and happiness light up the eye and crown the brow where sat inanition and gaunt despair.

This is no fancy picture, but a slight outline of the true portrait. I plead, secondly, an affirmation, and adduce the proof that the teeth themselves, with their accumulated accretions and roughened surfaces, from whatever source derived, are the exciting cause of the disease under consideration. The teeth in perfect polish and cleanliness, at and under the margin of the gums, whether of animals or man, produce no inflamed action in that tissue. It can be artificially produced, however, by insert-

ing a foreign body into or beneath its substance. If then diseased action can be set up by a foreign body, artificially introduced, it can be arrested and cured by withdrawing the same. And, therefore, if the tooth becomes an extraneous body by reason of the accretions and concretions upon it, near and under the free margin of the gum, and inflammation ensues, as it certainly will, the true prophylactic and pathologic treatment surely would be to thoroughly and carefully remove said concretion, tartar or roughness—polish the tooth and let nature take care of the rest. In two hours time the inflamed and bleeding gum will assume a lighter color, its swollen tissue will begin to shrink to its normal thickness, will grow more tense and firm, and in twenty to thirty hours will grasp the neck of the tooth to the exclusion of all foreign matter.

I have thus pointed out the treatment of the disease in the first stage.

The treatment of the second stage is the same, only being careful to reach the extreme limits of the diseased action, breaking up the diseased tissue and removing every particle of tartar from the tooth, and necrosed bone from edge or margin of process.

The third stage presents greater difficulties from the greater depth of the active line of disease, and demands a firm and skilled hand, a delicate and nice touch, and, I might add, the transfer of the sense of sight to the finger ends. The sense of touch must be so trained and cultivated that all foreign bodies can be readily distinguished from tooth substance—live bone from necrosed bone—healthy from diseased tissue. This manipulation cannot be attained at once, but time and practice, with close and earnest study, will qualify and school the hand, and embolden the true and sensitive mind to achieve success in the treatment of this third stage.

Of the treatment of the fourth and last stage, little can be said, except that the loss of the tooth or teeth is inevitable. The tooth is held in place by a cartilaginous attachment or condition of the inverting root membrane, which holds it in place as a buoy is held in the water. The only alternative is extraction, for all the alveoli is obliterated, and nature refuses to reconstruct the socket anew. The fiat has gone forth, and we must acquiesce.

There is a point, however, in the third stage where one or more teeth begin to grow loose, that restoration to health and firmness, is not only possible, but quite certain, provided the operator is so self-possessed as to *know when* he has reached the *utmost limit* of *the disease*. If he fails to make a clean operation, that is to go fully to the line of healthy bone,

and to remove all foreign accumulations on the tooth, the disease is sure to show the fact instanter. If a speck of tartar, not larger than a small grain of gunpowder, be overlooked, the gum over it will manifest the fact by a reddened patch of the tissue several lines greater than the tartar underneath. We will assume, then, that operation is thoroughly performed. What then? Why this, surely, new bone cells are deposited in the crater-like depression in which the tooth stands, and calcifies around the tooth and makes it firm and strong in position. The gum firmly grasps the root above this new-formed bone, and presents a perfectly healthy appearance.

Some mouths present all four stages of the disease at the same time, whilst others, the younger patients, present only the first or second. So far from being a disease of old age, cases are numerous at seventeen, and even fourteen years. These, however, are in the first stage, and blessed are the eyes of that man who recognizes it and applies the remedial treatment thus early. No medicinal treatment is needed, farther than an astringent wash and myrrh tincture, full strength, touched to the gum with the end of the finger, is best of all.—*Penn. Journal of Dental Science.*

[Note. This subject is exciting so much attention, both here and in Europe, that we reprint what a valued correspondent says is the only authoritative statement of the matter, from Dr. J. W. Riggs' own pen.—Ed.]

A CASE OF EPILEPSY, SEEMINGLY FROM CONFLICTING HEREDITIES, AND SUCCESSFULLY TREATED UPON THAT HYPOTHESIS—CROWDED TEETH.

By A. F. Kinne, M. D.

A little boy, C. B., between eight and nine years of age, was found in convulsions in his bed, December 20, 1876. No deviation from health had been previously noticed. He had gone to bed as usual, and at the usual hour, and had just fallen into his first sleep. But he had been drinking new cider that day—perhaps too freely—and, as he was not apparently a very strong child, it was deemed possible that the nervous disturbance might be due to that.

Ten days afterwards, however, at the same time of day, and under similar circumstances, he had a second paroxysm, rather worse than the

first; and, as this time there had been no errors of diet, there was no longer room to doubt that it was a true case of epilepsy, and a searching inquiry was, of course, instituted to find out, if possible, the cause of it.

But nothing was elicited until we came to his teeth. He was in the midst of his second dentition. The new incisors had presented themselves above and below; the rest of the first set were all more or less loosened; several of them were decayed, and, at the root of one of the bicuspids, an abscess was forming, from which, two days afterwards, I got a small quantity of offensive matter.

Could the epilepsy have been caused by this abscess? Hardly; for, at the time of the first attack, it was not known to exist, and probably had not begun to form. Could it be attributed to the decayed teeth? Hardly, I say again, but more faintly, I must confesss, for a case of epilepsy was put upon record by Benjamin Rush, in 1801, which, in his opinion, was caused by decayed teeth, and which was cured by their extraction. This distinguished opinion was not to be quite disregarded, at any rate, and the defective teeth were at once removed. But the subsequent history of the case will show that this step alone did not go to the bottom of the difficulty.

There was evidence of a crowding of the new teeth, particularly of the upper canines and bicuspids. There was redness and tumefaction, and some tenderness, upon pressure, on both sides; and there was pain, sometimes upon one side, and sometimes upon the other, and not always confined to the facial regions. He often referred it—most frequently, perhaps—to the forehead and temples. And this pain was a prominent symptom, in the progress of the case, for several months. It was never severe, and was seldom complained of, except upon his first going to bed at night. And there was no nausea or vomiting; not much tendency to constipation; no intolerance of light or sound, and no dizziness. He ate well and slept well, and enjoyed his play.

But this "headache," as he called it, and the peculiar irritability of temper, which is so characteristic of these cases, and which had been noticed in this case from the first, still continued, and did not wear off until seven or eight months had elapsed, and the new teeth were pretty well grown.

My friend, Dr. John A. Watling, professor of dentistry in Michigan University, whom I consulted, suggested the probable dependence of the nervous disturbance, in this case, upon conflicting heredities, the rela-

tive size of the jaw and of the teeth, in his opinion, indicating that the child had got a small jaw from the side of the mother, and large teeth from that of the father, and hence the crowding. This was my own idea exactly. The facial bones of the patient's mother and maternal grandmother, are very small indeed ; while, in the case of the father, the teeth are large, and the head very large throughout.

The author of the Lumleian Lectures, says: "It is seldom that dental irritation produces convulsions, either from decay of the first set of teeth, or during the appearance of the second set, though to both of these rules I have seen an occasional exception, especially in cases where, from the narrowness of the jaw, the teeth of the second set are extremely crowded."* But he fails to intimate that these cases of "crowding" are ever due to a crossing of heredities. As the views of these authorities, however, are not in conflict, we may accept both of them, and especially as it can make no difference with the indications of treatment. These were very plain, viz.: To exhibit the bromides, and, if possible, keep the epilepsy in abeyance until the pressure should be relieved by a better development of the jaw. This we have done, and with apparent success, up to the present time. I have administered the bromide of potassium alone, and have followed, in general, the plan which the late Professor Niemeyer says he got from a "specialist."† My initial dose was seven and one-half grains three times a day, and the maximum quantity which was arrived at, the last of June, was forty grains a day. And this quantity, which was attended by the characteristic "acne-like" eruption, slight, however, in degree, was steadily continued until September the 30th. Once in January, and again in February, the night dose was inadvertently omitted, and the result, in both instances, was a very slight epileptic seizure. With these exceptions, the line of treatment above indicated, aided by a carefully regulated diet and regimen, has been faithfully followed out.

But in the course of the last four or five months, the evidences of an improved condition have seemed to warrant a relaxation of the rule. The facial development has been considerable ; the local evidences of dental irritation have gradually subsided ; the headache is now seldom complained of ; and the *morale* of the patient is so much better than it was, that, under careful restrictions, he has been permitted to take up his books again, and gradually resume his place in school.

* West on "Nervous Diseases." Phil., 1871. p. 42.

† "Text Book of Practical Medicine." Am. ed., 1878. vol. ii., p. 367.

And *pari passu* with this progressive improvement, but keeping sedulously behind it, the bromide of potassium has been gradually withdrawn. At present he is taking a night dose of ten grains ; and this dose occasionally omitted, perhaps, but not lost sight of, will be continued, and kept on hand to meet an occasional return of the old irritability, for a good many months to come.—*Detroit Lancet.*

ON PASSING EVENTS.

By "PHOSPHOR."

PROFESSIONAL PESTS.

Every profession—and for a matter of that we might say with equal truth every trade—is lowered by a class of illegitimate followers who will insist upon looking at their calling as a money-making proceeding only. The ordinary precept "to love our neighbor as ourself" is altogether ignored. If the person I wish to describe can manage, by an extra amount of cuteness, to overreach his fellow worker he rubs his hands with evident gratification, and considers himself a very clever fellow. Now, we have also our professional pests, but they differ in some respects from the under-selling, adulterating trade-pests. They work with an external covering of solicitude for the welfare of their brethren. You read their books, you scan their advertisements, and if you are ignorant of their real character, you feel inclined to acknowledge that they have so tender a regard for the interests of all classes of the community that they even set aside a certain day of the week to attend to their less wealthy patients in order that they may enjoy the luxury of doing good by charging only half fees. Fortunately this class has been, and continues to be, so frequently exposed, that their power to injure is every day becoming more circumscribed.

But there is another professional pest who works less conspicuously but none the less injuriously. He is frequently a man of many years' standing, he has not unusually a large house, and he carries on his profession to all external appearances respectably. If you dip into his past history you will find that he commenced life as an advertiser, and that he favors that method of making practice even at the present day. His great field of usefulness is giving lessons in mechanical dentistry. He will take a pupil for a week, or a month, or a year ; and if you will

only consent to pay him, he will put you through the whole "art and science of surgical and mechanical dentistry" in a dozen easy lessons. He advertises to chemists who wish to be dentists also, and tells them that he can teach them to take models in one morning, that he can promise to execute for them the best work with the best materials, and that he can so instruct them that after one or two trials they can put the work into the mouth themselves. To others he arranges for a fee of twenty pounds, or even less, to give them two or three months' instruction, which instruction, he contends, will enable them to set up for themselves, and if they have only the means to keep up a few advertisements, or to shower down upon the neighborhood they honor by their presence a good sprinkling of handbills, they can not only dub themselves "Surgeon-Dentists," but make quite a comfortable income. These are the men upon whom the onus of quackery principally falls—men who, in many instances, really know something of the dental art, and they give to any one willing to pay them a slight smattering of workshop proceedings. It is only right that members of the profession whose mechanical work is executed out of the house, should be aware that these practices exist, and upon their discovering that their mechanical assistants either give such lessons in dentistry, or work for the inexperienced chemist, leave them for more scrupulous mechanics.—*From British Journal of Dental Science.*

CHLOROFORM AND ETHER.

The medical papers for May record and comment upon recent deaths from anæsthetics as follows :

CHLOROFORM DEATHS.

Cases of death following anæthesia, by chloroform, administered for Dental purposes, are multiplying in America. The following is the verdict of the jury :—"The jury find that Elizabeth Neely came to her death March 20th, 1878, at No. 224, North Tenth Street, by chloroform administered by H. G. Winslow, M. D. ; and we find the said Dr. Winslow guilty of criminal ignorance in administering so powerful a remedy, not having made any examination of his patient." Winslow was really a graduate in medicine, and five out of the six jurymen were also regular graduates. We believe that protoxide of nitrogen has now pretty universally superseded ether and chloroform for Dental purposes in this coun-

ry ; and we are surprised to note, from the fatal cases reported in New York and Philadelphia, that chloroform appears still to be much used there by Dentists, and with culpable recklessness.—*British Medical Jour.*

It is our painful duty, continues this journal, to record this week two deaths from the administration of anæsthetics, as follows :

CHLOROFORM IN DENTISTRY.

The remarks which we last week made reprehending the use of chloroform in Dentistry, *à propos* of death in the Dentist's chair recently reported in America, have received an unexpected and painful application in London this week. On Saturday, the Coroner for West Middlesex held an inquiry at Shaftesbury House, High Street, Kensington, as to the death of Mary Dolores Dormer, aged 10, daughter of Mr. Herbert Francis Dormer. Mr. John Saxty Good, a Dentist, of 17 Phillimore Place, Kensington, stated that on Thursday last Mrs. Dormer brought the child to him for the purpose of having some teeth taken out ; and at the special request of Mrs. Dormer, an anæsthetic was administered by Mr. Thrupp, who always assisted the witness. No examination was made as to the physical condition of the child previous to the operation, and Mrs. Dormer was not in the room. A mixture of ether and chloroform was used. The child did not struggle at all. As soon as she became sufficiently affected by the anæesthetic, the operation was performed. Three teeth were removed, when a shadow seemed to pass over the child's face. The usual remedies were applied for restoring her, but without avail. She died in a few minutes. Mr. James Godfrey Thrupp, 37 Elgin Road, Kensington, said he was a surgeon. He had made the administration of anæsthetics his particular study, having practised at St. George's Hospital for some years. The child appeared to be perfectly healthy, the heat of the body being normal. No examination was made by thermometer. About a drachm and a half of the anæsthetic was taken, and the child was reduced to a state of total insensibility. After the operation was finished, a change came over the child, and the witness knew by the symptoms that she was either going to vomit or die. The circulation of the blood suddenly failed, and death immediately ensued. The jury returned a verdict that death was caused by syncope from the administration of choloroform, and that the death was due to misadventure. It is painful to add to the distress to which so shocking a misadventure must, we apprehend, give rise ; but we cannot help asking Mr. J. G. Thrupp, whether, "having made anæsthetics his particular study," he has not long

since arrived at the conclusion that peroxide of nitrogen is by far the safest anæsthetic for Dental purposes; and what were the reasons which induced him to forego the safer anæsthetic and employ the more prolonged but more dangerous one. Mr. Thrupp is, of course, not unaware of the very strong views which were publicly expressed some time since by Mr. G. Pollock, an eminent and much esteemed teacher at St. George's, as to the grave responsibility which attaches to the use in any case of any other than the safest anæsthetic. Is it ever right to use choloroform for Dental purposes? We wish the Odontological Society would pronounce an authoritative opinion on that subject; and we should hope that, if they were to do so, they would absolutely forbid it.

Mr. Thrupp himself gives the following account of this unfortunate case in the *Lancet*, as follows:

DEATH UNDER CHLOROFORM INHALATION.

To the Editor of the 'Lancet,'—Sir, On the 9th of this month, I administered a mixture of ether and chloform to a child, aged eight, with fatal result. The patient was healthy and well nourished, but very timid, and to overcome this latter condition I held a napkin sprinkled with Duncan's chloroform in front of the face, at a distance of about a foot. This I gradually brought nearer, and then added a small quantity of ether, which produced at once laryngeal irritation and general discomfort. This napkin was then removed, and another, containing about half a drachm of chloroform, used in its place, free access to the mouth being allowed for the surrounding air. Sleepiness was thus comfortably induced, and then ether was again freely used, and with this agent the complete anæsthesia was procured. The operation (the removal of two molar teeth) was successfully completed, and the pulse and breathing were all that could be desired. My patient shortly became partially conscious, and endeavored to get rid of some of the blood in her mouth. Suddenly a shadow seemed to pass over the face, which at once became livid, the pulse and breathing stopped, and the child was dead. All efforts to restore animation were fruitless.

I do not know of any parallel to this sad case, and offer this brief account to the profession. Hereafter I shall hope to give a more complete history of the event, with comments.

I am, Sir, your obedient servant,

Jas. Godfrey Thrupp,
Late Anæsthetist to St. George's Hospital.

Elgin Road, Kensington Park Road,
May 15th, 1878.

The following is the second case alluded to in the *Med. Times :*

A death has occurred under the administration of ether at the London Hospital. The subject of this accident was admitted into the Hospital on Friday evening, the 10th inst., suffering from a strangulated hernia The symptoms—constipation (dating from the previous Tuesday), dragging pain, aud stercoraceous vomiting—continuing, although the patient had himself reduced the hernia before his admission, it was decided to anæsthetise the man in order to more fully examine him, and with the view, if necessary, to operate. Ether was administered by one of the house-surgeons ; the patient was readily brought under its influence. There were no untoward symptoms of any kind ; the examination was proceeded with. The man breathed quietly and regularly for a few minutes, and then gave one sudden catching effort at inspiration, and died in spite of every effort to save him. It is noteworthy that his pulse continued to beat for about thirty seconds after breathing had ceased. At the autopsy the heart was found firmly contracted. There was no strangulation, though the gut showed marked traces of having been tightly constricted.—*From British Journal of Dental Science.*

DENTISTRY EXTRAORDINARY.

The *Lancet* has the following on this subject :

The horrors of teeth-stopping, with the preliminary gouging and filing are to many the most unpleasant of the sufferings which Dental necessities impose. Many persons prefer the pain of extraction, and to get rid of the offending member, to the annoyance of stopping. In future it would seem they may take their choice without the necessity of a sacrifice of the tooth if they prefer extraction. Dr. Weil, of Munich, has employed and advocated the method of first extracting the tooth, stopping it with amalgam or gold, and then replacing it. He states that the results are excellent, and the teeth can be freely used. He keeps the tooth out of the socket for one or two hours, as may be necessary, and yet the tooth ultimately is firmly fixed. He finds the method quite applicable to both bicuspids and molars. Since extraction can be performed under anæsthetics better than stopping, many persons will prefer the new method to the old, provided (and that is probably the doubtful point) the subsequent refixing does not involve more than complement-

ary pain, and provided also the method is found as successful in other hands as in those of the inventor's.

To the Editor of the 'Lancet.'

Sir,—In your journal for April 20th last, at p. 588, attention is called to the practice of extracting teeth, and then, after stopping them, replacing them. I was not aware that the practice was so uncommon. Some years ago, while in general practice, I had a case of very troublesome hemorrhage, after extracting a tooth. Failing to check the hemorrhage by plugging the alveolus with cotton-wool soaked with perchloride of iron, I cleaned and stopped the tooth, and replaced it in its alveolus. The hemorrhage was completely checked, and the tooth was allowed to remain. It afterward got firmly fixed, and proved as serviceable as ever. Subsequently I repeated the operation several times with perfect success. For a day or two a feeling of discomfort was complained of, but only such as is experienced by those who wear artificial teeth for the first time. To ensure success, the bleeding should entirely cease before replacing the tooth. The neglect of this in one or two instances caused a good deal of pain, and it was found necessary to extract the tooth a second time.

Yours, truly,

John Treharne.

—*From British Journal of Dental Science.*

NOTES.

The American Dental Society of Europe.

This Society will hold its Sixth Annual Meeting, in Paris, on Monday, September 2, 1878, at the offices of Drs. Crane and Kingsley, No. 7 Rue Scribe. The meeting will be organized at 10 o'clock, A.M., and the sessions continued until all business is finished.

Subjects for Discussion: 1st. Influence of Diseased Teeth on other and remote Organs. Essayists: Drs. George W. Field, C. Kingsley, Prof. James Trumann.

2d. Modes of Manipulating Gold in filling Teeth. Essayists: Drs. C. M. Wright, A. H. Sylvester, J. B. Young.

3d. Incidents of Office Practice. (The Executive Committee urgently request special attention to this subject, and expect each member to make a memorandum of cases of interest.)

4th. National Types of Teeth. Essayists: Drs. N. S. Jenkins, J. G. Van Mater, Alfred Fuchs.

5th. Plastic *versus* Gold. Essayists: Drs. J. W. Pritchard, N. W. Williams, Johannes Paetsch.

The time appropriated to each speaker is ten minutes No one is expected to speak more than twice on the same subject, without consent of the Society. All are invited to participate in the discussions.

Officers of the American Dental Society for 1878: President, Dr. C. M. Wright, Basle; Vice-President, Dr. Charles Kingsley, Paris; Rec. and Cor. Secretary, Dr. A. Boyd Doremus, Zurich; Treasurer, Dr. N. W. Williams, Geneva; Executive Committee, Drs. J. W. Crane, Paris; G. W. Field, London; Alfred Fuchs, Berlin; Membership Committee, Drs. C. Kingsley, Paris; F P. Abbott, Berlin; J. W. Pritchard, London.

Rhode Island Dental Association

At the organization of the Rhode Island Dental Association, in the City of Providence, on the first Tuesday evening of July, 1878, the following officers were elected for one year:

President, Dr. A. W. Buckland, of Woonsocket; Vice-President, Dr. H. F. Marshall, of Providence; Secretary, Dr. L. L. Buckland, of Providence; Treasurer, Dr. Wm. P. Church, of Providence. Dr. Wm. Barker, at whose rooms the Association met, read a paper upon the care and treatment of the deciduous teeth Arrangements were made for the holding of meetings on the first Tuesday evening of each month.

L. L. BUCKLAND, *Sec.*

American Academy of Dental Science.

BOSTON, July 16th, 1878.

To the Editors of Johnston's Dental Miscellany:

GENTLEMEN,—The time of Annual Meeting of the American Academy of Dental Science has been changed from the last Monday in September to the last Wednesday in October, believing this to be a more favorable time for securing a large attendance. Members and others please take notice of the change.

Yours truly,

GEO. T. MOFFATT,

Cor. Sec. Am. Acad. Dental Science.

South Carolina State Dental Association.

The eighth Annual Meeting of the South Carolina Dental Association was held in the City of Columbia, on the 4th of June, 1878; the State Board of Dental Examiners sitting at the same place and time. After an interesting and harmonious session of three days the Association adjourned to meet in the City of Charleston, on the second Tuesday in July, 1879. The following officers were elected for the ensuing year: President, Dr. J. B. Patrick, of Charleston; 1st Vice-President, Dr. J. H. Alexander, Columbia; 2d Vice-President, Dr. A. P. Johnston, Anderson; Corresponding Secretary, Dr. B. H. Teague, Aiken; Recording Secretary, Dr. G. F. S. Wright, Columbia; Treasurer, Dr. T. W. Boucher, Cheraw; Executive Committee, Drs. R. A. Smith, H. D. Wilson, Jos. Quattlebaum, D. L. Boozer, W. L. Reynolds.

Operative Dentistry.—Drs. B. H. Teague, C. C. Patrick, T. B. Legare, D. R. McCullum, G. B. White.

Mechanical Dentistry.—Drs. E. C. Jones, B. J. Quattlebaum, H. B. Rice, B. A. Muckenfuss, J. R. Thompson.

Delegates to American Dental Association.—Drs. T. T. Moore, G. F. S. Wright, W. P. Oneill, A. L. Norwood, J. B. White.

Delegates to Southern Dental Association,—Drs. G. F. S. Wright, H. D. Wilson, B. H. Teague.

State Board of Examiners.—Drs. J. B. Patrick, J. S. Thompson, T. T. Moore, G. F. S. Wright, W. S. Brown.

B. H. TEAGUE, *Cor. Sec.*

Wilkerson Chair.

Messrs. Ash & Sons and Mr. Rutterford have both drawn our attention to the latest addition, to the already large variety of American operating chairs, invented by Dr. M. B. Wilkerson. It has several new features, and is altogether a most thoroughly complete and easily adjusted, as well as handsome, piece of dental furniture. Its movements are easy, silent, and mainly controlled by the operator's foot; for instance, the seat, which ranges from 23 inches from the ground to 36 inches, is is raised, with the patient seated, by pressing the foot on a convenient long lever—which, when out of use, can be turned under the chair; eight such pressures complete the rise, but it may rest after any movement; should the patient require lowering the foot presses aside a lever, and slowly, gently, noiselessly, almost imperceptibly the descending takes place, but stops the instant the lever is released. Another lever is touched and the chair may be rotated on its axis right round or as easily fixed at any point. Touch another lever and with ease the back and seat assume any desired incline, and so beautifully is the balance adjusted that the weight is but little felt. So far the foot alone is needed. The foot-rest, or rather rests, set at five or six different heights and distances and are under the control of either operator or patient. The back rises and falls 12 inches, and is fixed at any height by a hand-lever; it has a half back, set on springs, to support the small of the patient's back, and from the sides of this are two mysterious-looking handles; pull them and the half back suddenly becomes a small seat, almost sufficiently tempting in its prettiness to induce the most refractory of little martyrs into so novel a position, and sufficiently high to bring the head on the same level as an adult's would be. The head-rest, which rises and falls three inches, is again a novelty, being adjusted on a ball-and-socket, which is affixed to a double-jointed arm very short and strong, and by some marvellous means *one hand-lever* controls and fixes the whole of the ingenious and comprehensive movements that this arrangement admits of—viz., forwards, backwards, to extreme right or left, and at any angle. At the side of this head-rest is another novelty in the addition of an arm-rest, which can be set at three different heights, and either to the right or left of the head, by simply pulling out a little button and turning as may be most suitable. It is spoken of as an "unique chair of great originality, having first-class requirements;" and it is certainly difficult to imagine where improvement can be sought for.—*British Journal of Dental Science.*

Toothache.

Editor Medical Brief: Having been a constant reader of the *Brief* for two years past, and having seen but one article on the treatment of toothache, I take this opportunity of explaining my means of treatment:

First. There are two kinds of toothache. one from a live nerve and another from a dead nerve. The only means of relief the medical profession can give in case of a dead nerve, is to paint the surrounding gums with equal parts of aconite and iodine, but in case there is a live nerve the best resort is to cleanse out all foreign matter from the cavity of the affected tooth and moisten a small piece of raw cotton with carbolic acid or creosote, and by means of any small instrument convey it to the nerve, being careful to cover the saturated cotton with another piece to prevent the saliva from washing the acid off the cotton. In ninety-nine cases out of one hundred this remedy will give almost instantaneous relief. In the majority of cases you can tell whether a nerve is living by syringing cold water in the cavity of the tooth.

Yours truly,

C. W. S., *Dental Practitioner.*

Washington, D. C., July 4th, 1878.

—*From the Medical Brief.*

COMBINATION WILKERSON CHAIR ATTACHMENTS.

STYLE 1.—As shown in cut, including nickel plated spittoon, with gold trap, and Allan bracket table, also with nickel plated tumbler holder.....$40 00

This table of walnut, handsomely ornamented with French walnut, is fourteen inches square and three inches deep. It has one drawer, fitted for about one gross of engine instruments; two drawers adapted for gold preparations, and two for filling instruments.

STYLE 2.—Same as above, with a porcelain cuspador instead of the nickel plated spittoon..... $32 00

STYLE 3.—Same as style 1, except with Morrison bracket table instead of Allan table..... $32 00

STYLE 4.—Same as style 1, except with Morrison table and porcelain cuspador, instead of Allan table and nickel plated spittoon..... $24 00

STYLE 5.—Same as style 1, less spittoon and fork, and tumbler holder..... $25 00

STYLE 6.—Same as style 1, but with Morrison table instead of Allan table, and less spitton, fork, and tumbler holder..... $17 00

STYLE 7.—Attachment and nickel plated spittoon and glass holder (no bracket) $25 00

STYLE 8.—Same as style 7, except with porcelain cuspador instead of nickel.. $17 00

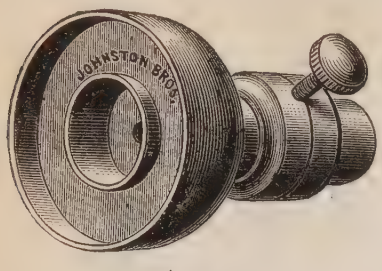
NOTE.—We can supply a few very fine rosewood bracket tables—Morrison style—fourteen inches square and one inch deep, at four dollars each above the price with Morrison walnut table, or four dollars less than where the Allan table is supplied.

For plain cheap spittoon see Chair advertisement.

SHANNON'S DISK MOUNTER.

THE INVENTION OF DR. W. T. SHANNON.

The SHANNON DISK MOUNTER enables one to do well with the greatest rapidity, what before has been done imperfectly and slowly by such dentists as have essayed the task at all. The directions are simple enough. To mount an "Arthur" or other disk so that it will be perfectly true on its mandrel: Take a screw mandrel or an old bur, warm the end which is to be bedded in the corundum over a spirit lamp, then pass it through the center of the disk; then, while still warm, pass the mandrel into the large end of the mounter, and press the disk on to it, having the face of the disk held firmly against the face of the mounter until it cools, and so is fastened—when it will be found to be true.



Price, - - - - - - - - $1 00

JOHNSTON BROS.

Patent applied for. 1260 BROADWAY, N. Y.

IRIDIUM PLATINA NERVE BROACHES.

They possess the following advantages:

They do not corode in the slightest degree, even when exposed to moisture, acids, iodine, or other medicines.

They can be cleansed perfectly from diseased matter, which gets on them when used to extract dead nerves, or from traces of medicines used in treating diseased teeth, by heating to redness in the flame of a spirit lamp.

Price, per package ($\frac{1}{2}$ dozen)..... $1 50

" ($\frac{1}{4}$ " 75

JOHNSTON BROS,

1260 Broadway, N. Y.

SPECIALTIES.

For full description of each of the specialties mentioned below see previous numbers of *Johnstons' Dental Miscellany*. (Specimen copies free on application.)

LIQUID NITROUS OXIDE.

PURE.

Can be kept in the cylinders for years—indefinitely—without deterioration.

Price of 100 gallon cylinder, $10—filled	$16 00
Refilling (express charges paid by us)	6 00
Price of 500 gallon cylinder $22, and 500 gallons of gas	44 50
Refilling (500 gallons gas), freight paid by us	22 50
Price of 1,000 gallon cylinder $36, and 1,000 gallons of gas	81 00
Refilling (1,000 gallons of gas), freight paid by us	45 00

APPARATUS FOR LIQUID NITROUS OXIDE.

1. THE SURGEON'S CASE.

No. 1 (5 gallon bag) price $42. No. 2 (7 gallon bag), price $44

2. THE NICKEL PLATED GASOMETER—very ornamental.

Price, with Inhaler and all necessary adjuncts for administering gas, $140 00
Either 100 or 1000 gallon cylinders can be used with each gasometer.

3. THE JAPANNED GASOMETER.

Plainer, but otherwise same as above.....$90 00

4. TRIPODS—for holding cylinders of Liquid Nitrous Oxide, when one desires to dispense with the morocco case of the Surgeon's Case, or with the gasometer.

Price of Tripod, for 100 gallon cylinder	$4 00
Same with filled cylinder, and all needed adjuncts	34 00
Price of Tripod for 1000 gallon cylinder	8 00
Same with 1,000 gallons of gas, and cylinder, and all needed adjuncts,	103 00

5. The Suspension Engine—with Cone Journaled Hand-Piece. The steadiest and most accurate dental engine made.

Price.....$50 00
With Lock-Bur Right Angle.....$55 00

6. The Remodelled Morrison Engine.

Price.....$30 00
With Cone Journaled Hand-Piece..... 35 00
With Lock-Bur Right Angle..... 40 00

7. Johnston's Adjustable Fountain Spittoon.

Can be adjusted to any height of the chair, and moved to and from the patient, giving the operator the opportunity to work on either side of his chair, without annoyance from the spittoon.

Price, handsomely plated.....$60 00

The Dentist's Appointment Book
AND POCKET RECORD.

Printed in Carmine and bound in Morocco, with rubber fastenings and card pocket, $1.25

JOHNSTON BROS.

DENTAL PICTURES:

Pictures on Dental subjects are not very numerous, and will always possess interest to practitioners of dentistry. Having reproduced several copies of ancient paintings and engravings, illustrative of dentistry in other countries and in olden time, as frontispieces for the Dental Miscellany, we have, at the request of friends, also printed them upon plate paper, in suitable form for framing or for preservation in a portfolio.

Those now ready are—

1. Der Zahnarzt—From a Steel Engraving of 1672.
2. The Tooth Drawer—English.
3. The Monkey as a Dentist—From a painting by DeCamps, 1840.
4. Der Zahnbrecker—From a German Plate.
5. Transplantation—1787. By Rowlandson.
6. The Ludicrous Operator. By J. Harris, London, 1768.
7. Primitive Dentistry. Scene in Persia by an eye witness.
8. Fifth Pair of Nerves—not colored. From Tomes' Dental Anatomy.

Price each, by mail, 50 cents.

JOHNSTON BROS.,
Broadway, cor. 32d St., N. Y.

FLOSS SILK.

A superior article, per dozen, $1 50.

JOHNSTON BROS.,
1260 Broadway.

JOHNSTON BROTHERS'

Cone Journal Hand-Piece.

The only Hand-Piece which stands the test of long use without wearing shakey and out of true.

THESE HAVE BEEN IN USE FOR NEARLY TWO YEARS, AND ARE STILL RUNNING TRUE AND IN GOOD CONDITION.

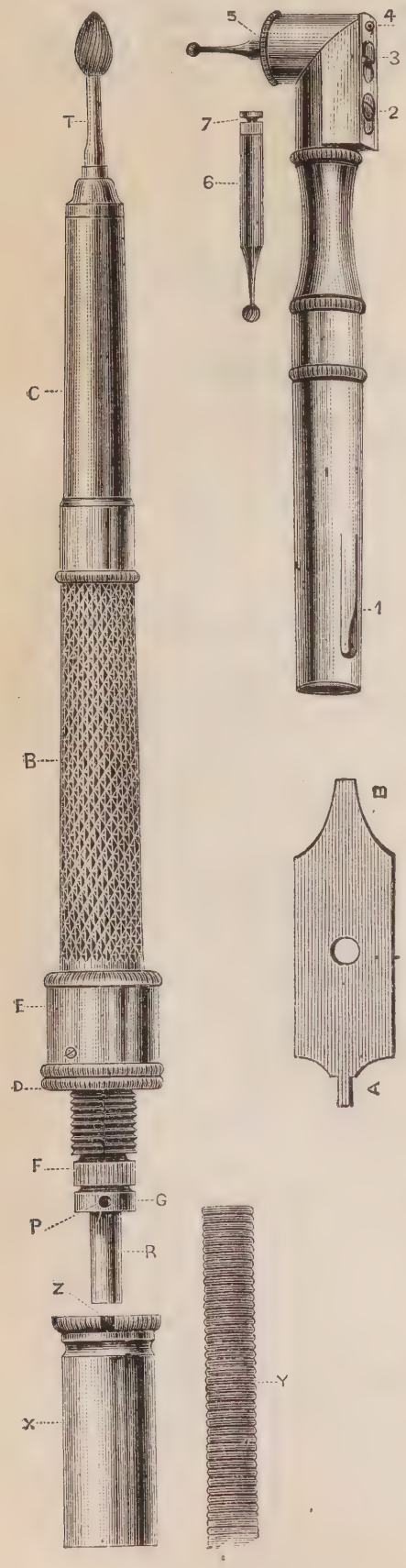
IN THE ESTIMATION OF MANY WHO HAVE THE CONE JOURNAL HAND-PIECE IN USE, IT ADDS A HALF TO THE EFFECTIVENESS, AND HENCE TO THE VALUE OF THEIR ENGINES.

IT IS READILY ATTACHED TO EITHER OF THE ENGINES MADE BY US, OR TO THE S. S. WHITE.

SEE THE FOLLOWING PAGES FOR DESCRIPTION, CUTS, AND TESTIMONIALS.

THE CONE JOURNAL HAND-PIECE,

THE GREATEST IMPROVEMENT IN DENTAL ENGINES SINCE 1872.



No matter how hard the bearings of a Dental Hand-piece may be made, if they are constructed as they have been hitherto, they will soon wear loose and shakey, and allow the bur to wabble.

By making them conical we secure two great advantages.

1st. The Journals are larger, and so present more surface to stand the wear.

2d. The little wear there is can, at any time, be taken up by forcing the cone on the spindle further into its seat, so preventing any shake and at the same time bringing the spindle to a true centre.

In our Cone Journal Hand-piece the cones are large and are *all of hardened steel*, and in addition are very carefully protected, so that it is almost an impossibility for any polishing or grinding material to get to the bearings. In the old styles of Hand-pieces it will be remembered the shank of the bur goes inside the nose-piece, and directly through the principal journal of the Hand-piece into the spindle, and so frequently carries in the polishing material used—be it pumace stone or corrundum. In the Cone Journal Hand-piece the spindle extends out-

side the nose-piece, and the bur goes into a socket in its end, thus making it impossible for the bur to carry any dirt to the journals or bearings. There is no opening through the case of the Hand-piece through which oil can find its way to the hands of the operator or to the lips of the patient. The right angle slips on over the end of the Hand-piece and securely locks itself so that it will neither revolve nor detach itself.

An Improvement only Found in this Hand-Piece.

The right angle burs are securely held in the right angle by a new locking device, which is both simple and effective.

The end of the spindle R. is bored out at the end to receive the end of the cable of the S. S. White engine, while the outside is properly sized to take the regular driving spring of the Morrison engine.

A small screw-driver and directions for taking apart accompany each Hand-piece, though, with a fair usage neither need be touched for months, certainly not until it is necessary to clean the Hand-piece.

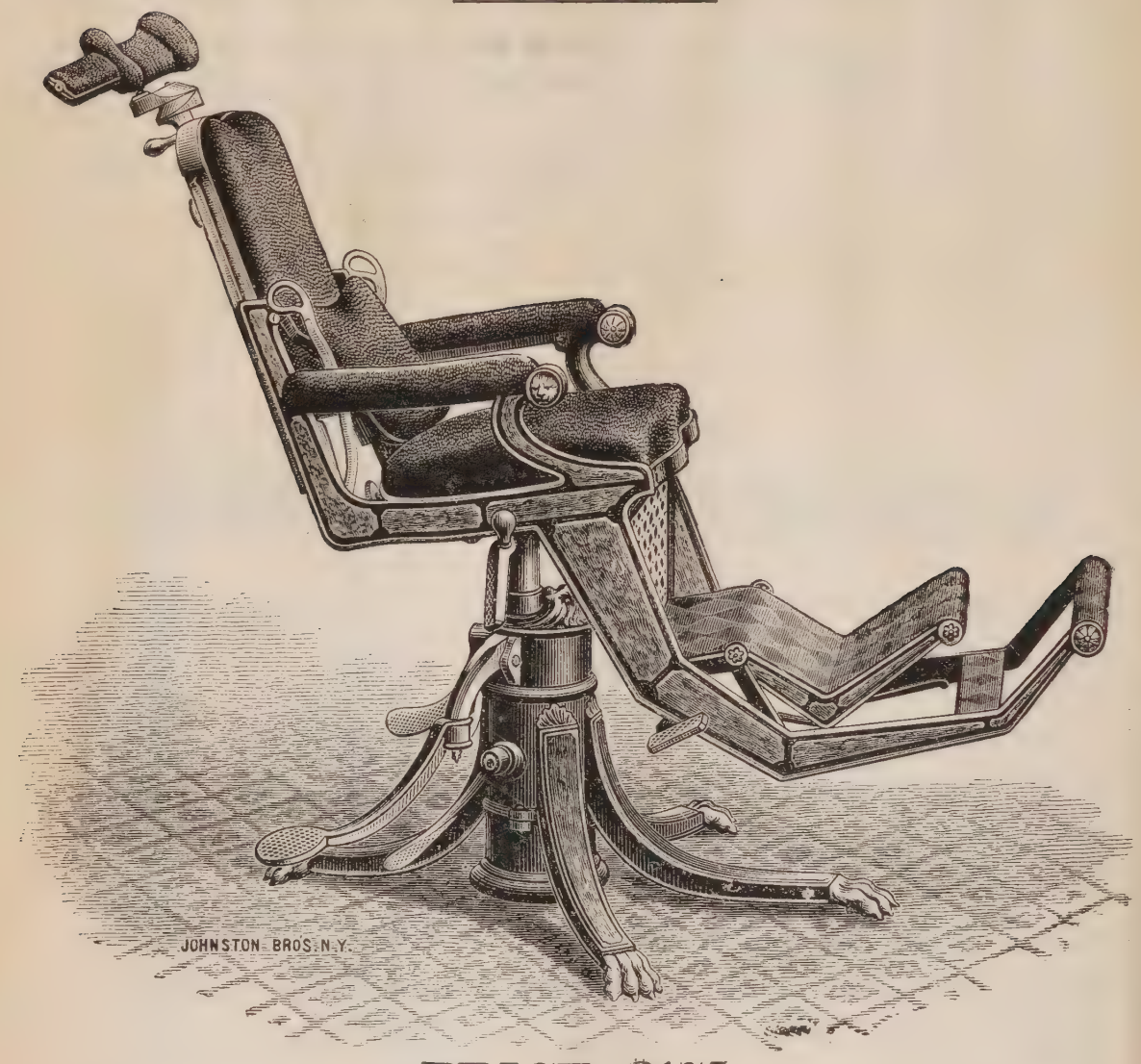
The burs used with other engines or hand-pieces—or the various attachments for the S. S. White hand-piece—are easily and cheaply altered to fit the Cone Journal Hand-piece.

PRICES.

Cone Journal Hand-Piece, with 1 doz. burs, - - -	$10 00
New Right Angles, with bur-lock, - - - - -	5 00

Wilkerson Dental Chair.

PATENTED NOV. 20, 1877.



PRICE, $175.

Spittoon Attachment with porcelain Cuspador	$6 00
" " metallic Cuspador and gold trap	14 00

The cut is a good representation of this unique chair. The acknowledged requirements of a first-class dental chair have been here secured by Dr. M. B. Wilkerson—the inventor—by methods showing great originality. All cranks are dispensed with and levers substituted for them. The chair is raised by pressure of the foot on the long lever, which hides the back foot in the cut. This operation requires very little effort, and occupies but eight seconds, and is only equivalent to stepping up eight steps. To lower the chair one has only, with the toe of his boot, to raise the lever just back of that first named, and the chair sinks rapidly and noiselessly until the lever is dropped, when it instantly stops. Except when in use the long lever folds in under the chair.

A touch of the lever in front of that just named, leaves the chair free to rotate through the whole circle. Directly beneath the seat of the chair, and close to the seat, is shown a lever, which, when pressed forward, permits the rocking movement while the lever is held, but whenever released fastens the chair in position.

Thus the three principal movements, elevation, rocking and rotation, are accomplished. The minor movements, all of great importance, however, are the raising or lowering of the back of the chair; the raising in like manner of the head-rest; the slight rocking of the seat of the chair, so as to prevent the patient from sliding forward; the adjustment of the footstool at various lengths and heights; the spring back support to rest the small of the back. This, at will, is converted into a capital child's seat.

An arm-rest is shown at the right of the head-rest. It can be secured on either side of the head-rest at will.

The whole chair is of the most substantial construction and highly ornamental. It will be upholstered in either green or garnet plush or in leather.

This is *not* an hydraulic chair. It has *no pump*, but is raised simply and solely by a lever actuated by the foot. When raised, the elevation of the central column, which supports the chair, tends to produce a vacuum in the chamber through which it passes, and this chamber is immediately filled by a column of oil, which, opening a valve at the bottom of the chamber and directly following up the central column of the chair, blocks it up whenever the lever ceases to raise it higher. Of course, whenever the same valve is tripped, the oil flows back into its receptacle, and the chair is rapidly and noiselessly lowered. *Not one drop of oil* has ever or can ever find egress from the inner base of the chair to its exterior. So much to silence constant misrepresentations of another dealer.

ADVANTAGES.

1st. It can be raised with the foot of the operator, and by a very slight effort.

2d. It can be raised in half the time of any other dental chair, except the Morrison.

3d. It can be lowered without exertion of force, and as much or as little, or as fast or as slow, as desired, by merely opening a valve.

4th. Its range of movement is superior.

5th. It has a perfect forward and backward movement, so that the patient can be rapidly inclined at any angle by a very slight exertion of force by the hand.

6th. Its arrangement for children is unique and excellent.

7th. Its footstool is readily adapted to the wants of large or small persons.

8th. Its head-rest is completely firm in any position in which it may be placed, has a large range, and is fastened by a single movement of the hand.

9th. The operator can control all its movements without once taking his hand from the mouth of the patient.

10th. It has a perfect rotary movement.

11th. By means of an adjustable foot it will stand firmly on any floor, however uneven.

We have orders for a large number, and are receiving more daily, and entering them in rotation.

JOHNSTON BROS., 1260 Broadway, N. Y.

JOHNSTON BROTHERS & SELBY, 23 N. Charles Street, Baltimore, Md.

The Morrison Dental Chair.

Comfort for both Operator and Patient, Rapid Movement, Simplicity of Construction, Great Durability.

The desirable features of a dental chair are almost completely enumerated above. The Morrison Chair answers each of these requirements more completely than any other chair made.

It contributes to the ease of the operator:

1st. By the lightness and rapidity with which the patient is raised or lowered to a convenient position.

2nd. By the form of its back, which is so narrow as to render it unnecessary for the operator to stretch to reach his patient.

3d. By permitting him to drop either arm of the chair entirely out of his way.

4th. By making it possible to operate in either a standing or sitting posture with equal facility.

It affords comfort to the patient:

1st. In the arrangement by which the lower back-pad may be moved forward to support the small of the patient's back.

2nd. The upper back-pad is readily raised or lowered, so as to exactly adapt itself to the wishes of any patient as if the chair had been made for this one person.

3d. By the readiness with which the patient may change the foot-stool from one position to another as suits their notion at the moment, and without disturbing the operator.

If desired this chair can be furnished with either the usual upholstery of dental chairs, or with Turkish upholstery—soft and with springs; or with summer seats and back—of cane; or with separate sets of all of these, which can be changed from season to season by the owner without difficulty or the necessity of employing mechanics of any kind.

Its movements are very rapid.

It can be raised from its lowest position, in which the seat is 15 inches from the floor, to its highest, 42 inches above the floor, in seven seconds. Both low

and high based chairs are here combined in one, giving a vertical range of more than two feet.

It has no equal in operations upon Children.

The child can be raised as high as needed by the tallest operator.

It is provided with a comfortable back and head-rest, exactly as is a grown person.

The foot-stool is quickly adapted to children of any size.

It is extremely simple.

The principal movements of the chair and head-rest are all under control of but three clamps, and the chair is adjusted in height by a single crank.

By one of the above-mentioned clamps it is securely fastened at any desired inclination, and all done in an instant.

It is very durable, because

1. Being made almost entirely of metal, open joints or season cracks are impossible.

2. The upholstery of this chair is so arranged that it can be renewed, by exchange of the upholstered parts, without leaving the rooms of the operator and at moderate expense.

ACCESSORIES.

CASTORS.—To secure the *rotary movement* for such persons as desire it, legs have been cast, having recesses in the feet, into which Castors are inserted. The castors in the front legs roll laterally only, so that by them the patient's face may be turned to the light. When in the right position a locking device permits you to fasten the castors so that they cannot be moved until unlocked. The castors in the back feet are so placed as to revolve only back and forward, so that while they permit you to easily roll the chair like a wheelbarrow out of position if you wish to sweep, they cannot be moved by the force exerted in plugging a tooth.

NARROW BACK PAD.—To be used sometimes instead of the top pad, and sometimes as a third pad when the back of the chair is stretched to full length.

SPITTOON ATTACHMENT—see in the cut—is a cheap and convenient substitute for a separate spittoon. Is more convenient and costs less.

HEAD-REST.—The Morrison Head-Rest is a *thoroughly* good one, and has given general satisfaction. It is supplied with the chair if we are not otherwise directed, and the price of the chair as named includes this rest. The Johnston Head-Rest is *our latest*, and is everywhere approved. It can be had with the chair at an extra cost of $8.00. It is shown in the cuts.

EXTRA UPHOLSTERY.

Turkish Upholstery.

Some persons having desired a softer style of upholstery than is usual in dental chairs, we have adopted, after many experiments, a modification of what is usually known as the Turkish chair. The seat is made about four inches higher in front than at the back, and both it and the lower back are made very soft by the liberal use of steel springs and hair, the edges being kept full by a piece of heavy spring wire which is built into the upholstery.

The perpendicular edges are covered with a puffing to match, and "set off" with handsome silk cord.

The arms and upper back pads are made heavier than usual, and are puffed and corded to match the seat.

Real Morocco.

We also have produced a very elegant article by the use of real morocco, handsomely embossed. It is durable and particularly desirable for warm climates.

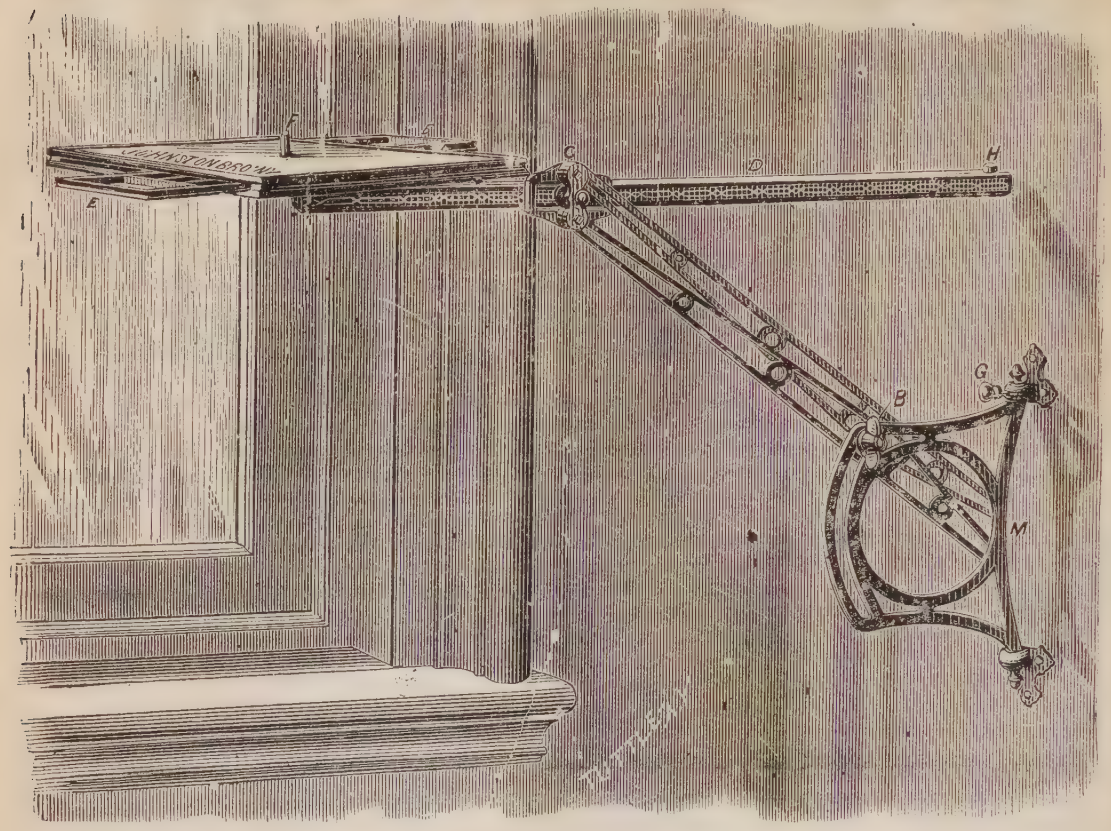
PRICES.

In fine green or garnet plush—with Morrison Head-rest	$ 150.00
Boxing	5.00
To which price add, if ordered:	
With Castors	10.00
With Johnston Head-rest, instead of Morrison	8.00
With extra back-pad	4.50
With spittoon attachment and porcelain cuspador	8.00
With nickled metallic cuspador and gold trap	10.00
With nickled metallic cuspador and gold trap, and nickled spittoon attachment	18.00
With Turkish upholstery	15.00
Real morocco embossed	10.00

JOHNSTON BROTHERS,

11 Broadway, cor. 32d St., N. Y.

MORRISON DENTAL BRACKET.



PRICES.

With Black Walnut Table, 12 inches square.....$25.00.
With Rosewood Table, 14 inches square, and Velvet Top, and Drawers about five-eighth inch deep, lined with Leather..... 40.00.
The Rosewood Table alone, as above, to fit any Morrison Bracket..... 17.00.
Boxing..... .....$1.00.

The cut represents the table in its highest position, and distant from the wall a little more than half the distance it is capable of taking. By loosening the thumb-screw B, and allowing it to rest in the bottom of the slot, (instead of at the top as represented here,) the table will occupy a position as much below M as it now does above the same point. The extreme range, that is, the distance between the table when at its highest and its lowest position, is 24 inches.

M represents a metal frame which is secured to the wall or other support by screws. It swings from side to side as a gate on its hinges. C. M. represent light but strong metallic arms, hinged at M as a centre and moving up or down. At B is a thumb-screw passing through a slot in the frame M. By it the arms can be firmly clamped at any desired height.

At C is a slide-rest through which the hollow rod D passes freely, and may be clamped at any distance from its ends. At one end of this bar a square table is supported, having in it foil and instrument drawers. This table is capable of rotation round F, which is the burner of an alcohol lamp, the alcohol being contained in D and introduced at its further extremity H. Among the advantages of this bracket are these:

1st. It combines a greater variety of range and movement than any other.
2d. It is rigid in whatever position it is clamped, and will hold 15 lbs. with steadiness.
3d. It provides a clean receptacle for foil and instruments.
4th. It is obvious that a square table is very much more convenient as an instrument stand than a round one.
5th. Its drawers extend through the table and can be opened from either side.
6th. To those having a Morrison Chair it is almost indispensable, as it will follow the chair to either its lowest or its highest position.

It is handsomely ornamented and nickel-plated throughout, so that it is a very beautiful addition to the furniture of the operating room.

JOHNSTON BROTHERS,
Broadway, cor. 32d St., N. Y.

HARVARD UNIVERSITY.

DENTAL DEPARTMENT.

BOSTON, MASS., 1878-79.

The plan of study of this School has been radically changed. Instead of the usual oral examinations at the end of the course, written examinations are had at the end of each year on the subjects pursued during the year, and instead of the customary repetition each year of the lectures and studies of the preceding year, the course is progressive over a period of two years, and the student is required to pass a satisfactory examination in the first year studies before being allowed to proceed to the next. At the end of the course a satisfactory examination must have been passed in all the subjects.

The new year begins Sept. 25th, 1878, and ends the last Wednesday in June, 1879. It is divided into two equal terms, with a recess of one week at Christmas, and another in April.

The University Degree, D.M.D (*Dentariæ Medicinæ Doctor*), is conferred upon those who fulfill the requirements.

FEES.

There are no fees for matriculation, for the diploma, nor for the demonstrators. For the first year a student is a member of the school, the fee is $200; for the second year, $150; for any subsequent year, $50.

For information address,

THOS. H. CHANDLER, Dean,

222 TREMONT ST., BOSTON, MASS.

FRENCH CROWN AMALGAM.

The Manufacturer says of it: The Amalgam is composed of materials which the dental profession at large recognize as the best (except gold) for filling teeth. It is of finest quality. It has the merit of becoming hard in fifteen minutes after being prepared for use, and does not change color or shrink.

PRICES.

1 oz. box, with mercury	$3 00
⅔ oz. " " "	2 00
⅓ oz. in envelopes	1 00

For sale at wholesale and retail.

JOHNSTON BROS., 1260 Broadway, N. Y.

JOHNSTON BROTHERS' LAVA STRIPS.

PATENT APPLIED FOR.

For finishing fillings, a new and unequaled polishing material.

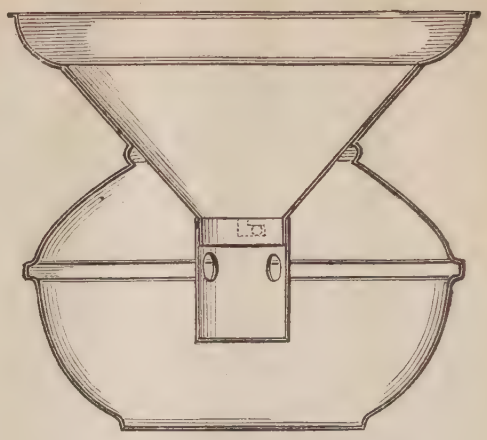
Thinner, more convenient and more efficient than corundum tape.

Price, per Box. ..... 50 cts.

JOHNSTON BROS., 1260 Broadway, N. Y.

NICKEL PLATED CUSPADOR WITH GOLD-TRAP.

CUSPADOR.



Section of the cuspador, showing the Funnel with gold-trap attached.

The cuts represent a metallic cuspador, handsomely nickel plated throughout, designed to fit the spittoon attachment of the Morrison Chair. As the funnel can be removed by simply lifting it from the Cuspador, all parts are as readily cleaned as is the porcelain Cuspador now in use. The gold-trap—which is an attachment of the funnel—will, in a short time, effect a saving sufficient to pay for the Cuspador.

PRICES.

Spittoon Bracket, plain.....not pictured.....	6 00
" " Nickel Plated— " "	8 00
Nickel plated Cuspador and Funnel with Gold-Trap..	$10 00
Funnel and Gold-Trap.....	3 50

JOHNSTON BROS.,
Broadway, cor. 32d St., N.Y

TOOTH BRUSHES.

A first-rate article.

4 Row Brushes, per dozen.....	$3 00
5 " " "	3 80
Children's Brushes "	2 30

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.

WILKERSON DENTAL REGISTER,

FOR SALE, WHOLESALE AND RETAIL BY

JOHNSTON BROS. & SELBY,

23 North Charles St., Baltimore, Md.,

AND BY

JONHSTON BROS.,

1260 Broadway, N. Y.

We quote Editorial Notice from "*American Dental Journal*":

"*Dental Register and Examination Book.*—By B M. Wilkerson, D.D.S., M.D., Demonstrator o Operative Dentistry in the Baltimore College of Dental Surgery. Baltimore, 1876.

"As a Dental Register this new work presents as complete, convenient, and concise a system as it is possible to prepare; and dental practitioners will find it as simple as it is useful.

"The plan, according to which it is arranged, requires the least practicable amount of time or labor in registering dental operations and delineating the condition of the oral cavity, thus meeting the requirements of the operator in such a manner as to give the greatest satisfaction.

"The diagrams, four in number on every page, are the special design of the author, and the most perfect for delineation which have yet been presented in a work of this kind. A book of this form containing 400 pages will register 1,600 patients, whereas the ordinary Case Book requires one entire page for each patient.

"This new Register is also arranged for conveniently representing the character of professional services for each member of a family, without regard to numbers, with as much facility as the appointments are entered in a 'pocket companion.' Blanks for name, residence, &c., opposite each cut, prevent the possibility of confounding patients. This new work is gotten up in a handsome form with index, and printed on excellent paper."

Will Register 1,600 Patients. Price, $4.50.

TRADE SUPPLIED AT LIBERAL DISCOUNT.

Second-Hand Chairs

At 1260 Broadway, N. Y.

No. 1.—AN OLD PORTER CHAIR, covered with striped reps, worn a little; has no movements, except Head Rest, raises and lowers. Suitable for an extracting chair. Price $15.

No. 2.—A No. 3 ARCHER CHAIR, covered with green plush (plush and gimp faded and worn a little) with No. 3 Archer Foot Stool, covered with red carpet, and a No. 1 Archer Extension Bracket and Table with Drawers. Price $60.

No. 3.—A No. 3 ARCHER CHAIR, covered with green plush. This is a new chair, and has not been used, is shopworn a little, with a No. 3 Archer's Foot Stool, new, covered with green carpet. Price $93.00.

No. 4.—A No. 4 WHITCOMB CHAIR, *rosewood*, illustrated on page 120 White's Catalogue, 1867, covered with *green plush*, foot-stool attached to chair. This Chair has two head-rests, one of Whit-

comb's pattern, and one of S. S. White's pattern, with large pad. The right arm has been removed for convenience, and a metal one substituted lower down. Is a good chair in every respect. Price, new, $230; will sell for $90.

No. 5.—A No. 2 ARCHER CHAIR, covered with green plush. Plush is faded, in fair order, with a No. 1 Foot Stool, covered with green carpet. Chair has old style rachet head- rest, with a Butler's Spittoon attached to chair. Price $55.

No. 6—A ROSEWOOD WHITCOMB CHAIR, covered with green plush; has a large pad on head-rest, in good order—foot-stool attached to chair. This is a rosewood chair, and is first-class in every respect. Price $75.

No. 7.—A No. 6 ARCHER CABINET CASE, used very little and as good as a new one. Cost price $90; will sell for 60.

No. 8.—A No. 6 ARCHER CABINET CASE, used very little, and as good as a new one. Cost price $90; will sell for $60.

No. 9.—A CASE OF SIX DRAWERS, on castors, a lock in every drawer, in good order, marble top. Price $20.

No. 10.—A LATHE, same style as old U. S. Lathe, in good running order, painted green; has no band, and no spindles for holding wheels and brushes. Price $10.

No. 11—A CABINET CASE, desk pattern, mounted on a stand, has castors, five drawers, and top opens on hinges, made very strong. Price $10.

No. 12.—A ROUND SPITTOON, wood, with marble top, funnel is broken. Price $5.

No. 13.—A WHITCOMB SPITTOON, for running water, illustrated page 126, White's Catalogue, 1867, without instrument support. Price $15.

No. 14.—An S. S. WHITE CHAIR, in good order. Price $125

No. 15.—A MORRISON CHAIR, green plush, in fair order and, otherwise first rate. Price $100.

No. 16.—A WHITCOMB CHAIR, solid rosewood, movements perfect, garnet plush, faded but good, with foot-stool attached and extra foot bar, and with instrument table attached. Price for all $70.

Boxing on all the above will be charged at cost.

SECOND-HAND CHAIRS,

FOR SALE BY

JOHNSTON BROTHERS & SELBY,

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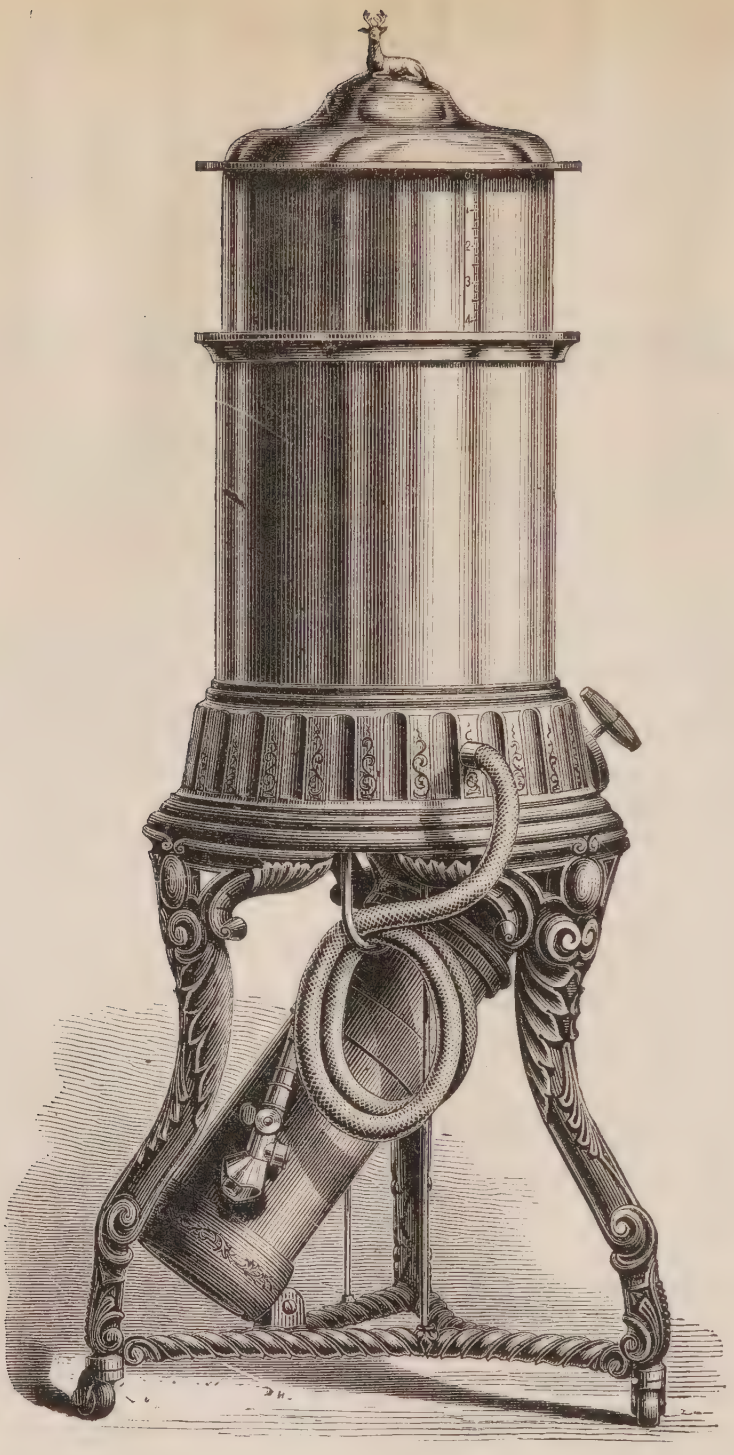

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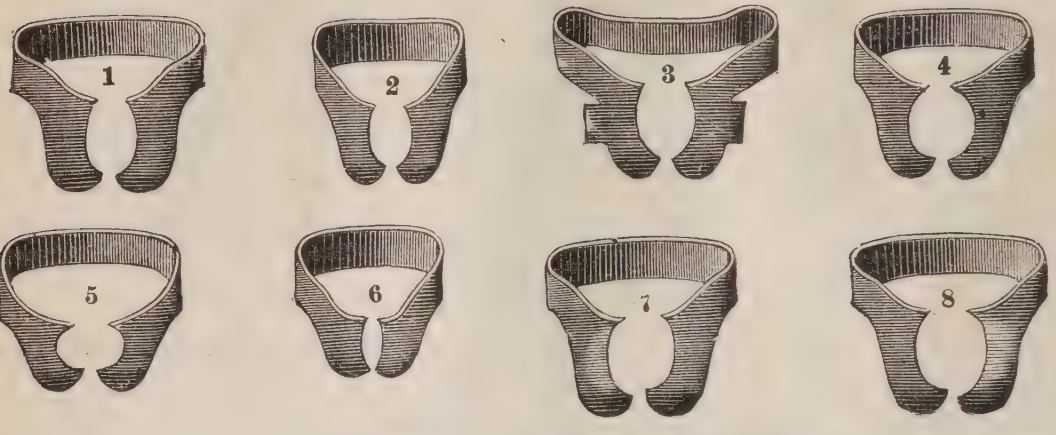

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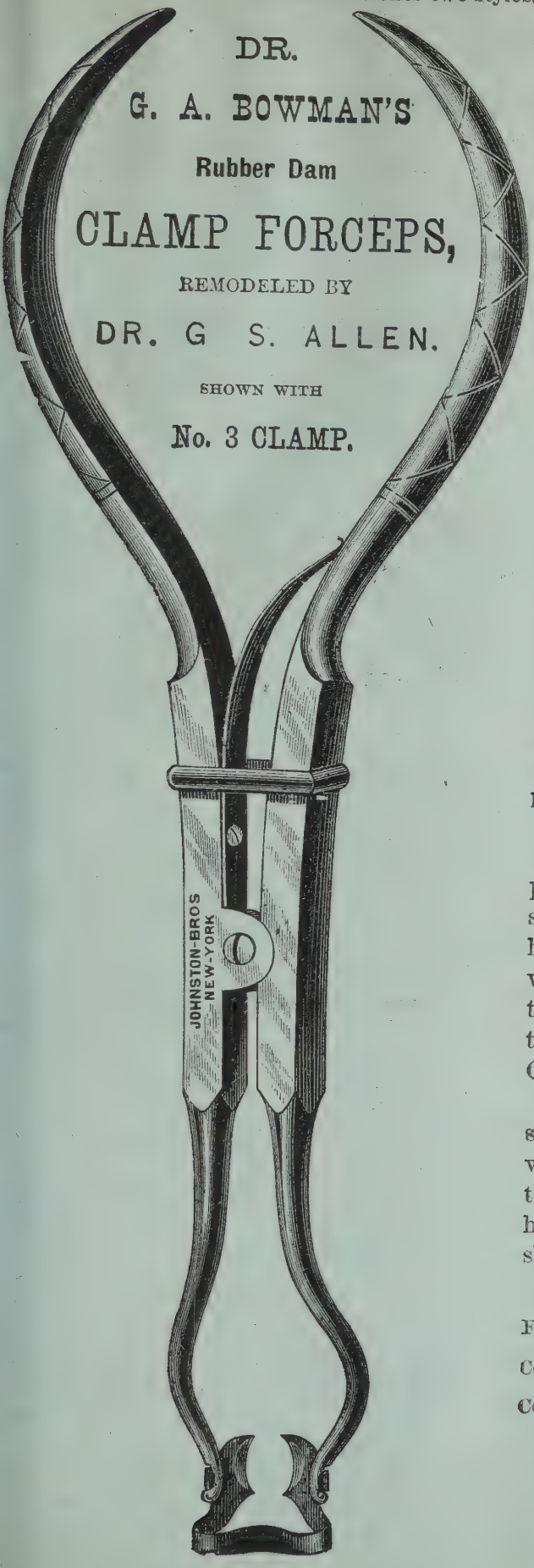

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AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL AND MECHANICAL LITERATURE.

SEPTEMBER, 1878.

NEW YORK:
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JOHNSTONS'

Dental Miscellany.

Vol. V.——*September, 1878*——No. 57.

THE PHYSIOLOGY OF VISION.

By W. S. Elliott, D.D.S., M.D.

The physiology of the senses is a border land on which the two great departments of human knowledge, viz: natural and mental science would seem to meet to solve the many intricate life problems which arise out of the very depths of man's nature and being. From the standpoint of physiology we may consider the functioning of certain organs adapted by nature to certain ends, and, from the plane of natural science, we may determine the coincident features of such organs with the results of man's constructive ingenuity and perseverance.

Laws, whether mental, physiological or mechanical, are fixities; they are absolute, as much so as are the facts of mathematics, and they work according to definite plans, though results may be modified through the controlling power of untoward environment; and we can observe how beautiful is the fulfillment when these laws are left to the favorable circumstance of selective adaptation.

The human eye is an example of the perfect result of these laws, working in harmony to the final accomplishment of vision. It challenges our admiration, not only from its intrinsic beauty of structure, but for its importance as a medium of knowledge, for probably to the greatest extent over all other sources is it the instrument of acquirement in all that pertains to the mental and physical well-being and happiness of man. Of all the members it has always been considered the choicest gift of nature, the most marvellous product of her plastic force, and

philosophers have extolled it as a crowning instance of perfection in an organism.

Consider what wonderful functions it performs; think of the penetrative power it possesses, and look at the brilliant picture and the riches it spreads out before us. It is through the eye that we enter so largely into connection with the exterior world; to it we are indebted for the innumerable pleasures we derive from the contemplation of the beautiful in art or nature; and through this medium alone we come to know and to appreciate the glory of the countless shining worlds that fill immeasurable space, the charming landscape of our own planet, with its dancing play of light and shadow, and the wonderful grades of life that pertains both to the vegetable and animal kingdom. With the aid of the other senses, it reveals to us the fixed properties of matter—the color, the form, the volume, the respective situation and states of repose and motion of bodies which surround us. It places us in the most intimate relation with this world of nature, allowing us to contemplate her at the same time in her most infinite details and her admirable whole.

The visual organ proves its transcendency by being situated in the most favorable position for the reception of impressions. Uppermost and anteriorally it is the more capable of directing and guiding the body in the act of locomotion, and of presiding over the various movements incident to the change of position.

So intimately associated is it with the brain that it reflects by its brilliancy the degrees of activity of the mind, and, in its connection with the face, it becomes at once the most prominent accessory to personal beauty and adornment.

We may not dwell upon the unfortunate condition attending the loss of sight. We know it to be a direful calamity, but we may be quite unable to form a fully adequate idea of the terrible darkness in which the blind man is shrouded.

How poignantly this loss was felt by our great Milton is painfully evident from his own words:

"With the year
Seasons return; but not to me returns
Day, or the sweet approach of e'en or morn,
Or sight of vernal bloom, or Summer's rose,
Or flocks or herds, or human face divine;
But cloud instead, and ever-during dark
Surrounds me; from the cheerful ways of men
Cut off, and from the book of knowledge fair;

Presented with a universal blank
Of Nature's works, to me expunged and 'rased,
And wisdom at one entrance quite shut out."

The physiological apprehension of external objects and influences is accomplished through a media of communication and certain specialized organs of reception, the function of which latter is to take cognizance of the impression made and to differentiate this into an effect which we nominate sense. For example, touch is accomplished by an impression made upon the peripheral nerve fibers of the skin, which impression is immediately transmitted to and recognized at the central seat of consciousness as *feeling*, or perhaps, under certain exaggerated conditions, as pain.

Nerves are the media of transmission common to all the senses—to sight and to hearing, to smell and to taste, and we can discover no difference in their structure, either microscopically or chemically. Then, to what shall we ascribe the marked difference in the nature of the sense? Presumedly, first, to the nature of the excitant; and, second, to the peculiarity of the apparatus which serves to co-ordinate the excitant. Thus the impingement of odoriferous substances upon the olfactory ganglion gives rise to the sense of smell, and the vibrations of the atmospheric air upon the auditory fibers gives us hearing. The one evidences the chemical nature of the excitant, and the other the mechanical; and no reversal of order would suffice to demonstrate the character of the phenomena.

The vibratory action of light will not function the sense of taste, neither will sound agitate the sensory tissues of the eye.

I desire now to ask your attention to the structure of this important organ, and I think, you will be able to follow me and come to a still higher appreciation of the science which reveals to us the laws governing the wonderful phenomena of physical life.

Within the depressions of the cranium are the apparatuses placed, being almost entirely surrounded, posteriorly and laterally, by bony walls, which afford proper protection to the delicate tissues contained within. The sockets are made up of sectional parts, the hard names of which I will not burden your memory with. Suffice it to say that they are seven in number, and at the apex of each conical receptacle are two openings called foramina, which transmit vessels and nerves to the brain. The eye-ball itself is composed of many tissues, to which we will call your attention in their proper order. Upon its outside is a dense fibrous mem-

brane analogous in its uses and relationship to the rind of an orange or the coat upon your person. It is exceedingly tough, and in its degree of vitality it is but a little removed from that of its bony surroundings.

If you will look into the eye of your friend, you will see a portion of it, and it is that which you have been pleased to call the "white" of the eye. Physiologists have named it the *Schlerotica*, or schlerotic coat. Remember, this is not so delicate and sensitive a structure as one would imagine. It is really a protective covering, and therefore is void of those elements which would make it respond quickly to injury or irritation. Next within this is a very different membrane—different in color and in sensibility, and different in its office. The schlerotica being white, this is black, or nearly so, and it is incapable of reflecting pure light. It is called the choroid. The shade, however, is not, in all cases, of equal intensity. There is a difference, proportionate to that which you will observe in looking into one's eyes, and pronouncing them light or dark. A prominent exception is manifest in the case of Albinos. Here the pigmentary substance is absent, and the membrane cannot perform the function assigned to it under normal conditions ; hence arises the difficulty of vision experienced by this class of persons. In old age, too, there results a reverberation of the rays of light within the eye through a partial wasting of this pigmentary material, exaggerating the otherwise growing impediments to correct vision.

The photographer would find it difficult, if not quite impossible, to concentrate the rays of light upon the slide of his camera did he not heed the physical laws governing the process, and copy Nature by painting black the lining surface of his instrument.

The next layer of tissue within the globe of the eye is the retina, a most complicated organ, and one that must excite your interest and admiration as you come to know its peculiar mechanism and function. It is a transparent membrane, and is the one upon which is spread the terminal fibres of the optic nerve. The rays of light, after having passed through the various lenses, is received here—and here, by the most mysterious process, they are transformed into sight.

Histologists have sought earnestly to reconcile the complicated structure of this tissue with the visual sense, and much has been ascertained to assist us in our researches. Although the optic nerve is spread out upon this membrane, it would be an error to say that the fibers were primarily acted upon by the light rays ; but we may not understand this until we have proceeded further in our investigations.

The retina is not a homogenous mass, but under the microscope appears divided into strata, the layers of which possess special characteristics, and to each of which is doubtless assigned a special function. Much obscurity, however, still obtains regarding this subject, and the world regrets the demise of the most accomplished investigator of modern times, Max Schultze, who died in 1874. To him is assigned the honor of settling many disputed questions which for a long period were exceeding ingly puzzling and unsatisfactory.

By the assistance of the opthalmoscope the retina presents the following appearance: The color is reddish, and the surface is plainly traversed in a somewhat tortuous manner by numerous blood vessels which emerge from one common center—the optic disk—and extend in various directions towards the periphery. At a point directly in the line of axis of the globe is a distinctive spot, called the *macula lutea* or yellow spot of Sommering; here the membrane suddenly diminishes in thickness, and at this point becomes the most sensitive portion.

The entire surface is also covered by nerve fillaments, (but imperceptible except through the microscope), which are the terminal ends of the optic. After distribution they penetrate again the membrane and finally end near to or upon the surface of the choroid.

There are at least eight layers; the lower and fillamentous one we have already spoken of, from which proceed certain cell formations known as ganglia, then reticulated and straight fibers, then again cells and fibers until we reach finally the layer of rods and cones which together we designate Jacob's membrane. It is at this point that the act of vision seems to be consummated, or rather where the excitant, whether it be the luminous rays or other agent, actuates the true perceptive elements. As before stated, the yellow spot is the most sensitive to external influence, and from this fact it becomes of special interest to the histologists, and more particularly since this exists only in man and the quadrumina. If we carry our observations to this point we will notice a considerable disparity of proportion between the various layers, and this is particularly so in the human eye. You will perceive as we approach the macula lutae and enter upon its more central portion, the tissual layers diminish in thickness and the elements of some of them entirely disappear, while others again are increased; the latter is confined to the cones, which become far more numerous and occupy quite exclusively the territory of Jacob's membrane. This fact leads to the conviction that the cones are the elements of the keenest perception, which view is other-

wise confirmed by comparative anatomy. In the ape much the same condition exists as in man, but in mammals of more nocturnal habits the rods take the place of the cones. It is supposed that the office of the rods is to take cognizance of the quantity of light and the measure of distances, while the cones have the power of analyzing the light and taking perception of its constituent colors. Color blindness may therefore be reasonably attributed either to the deficiency of the cones or to some pathological inability to respond to the excitant. As already stated, nocturnal mammals are possessed of only a limited number of rectinal cones, since there seems to be no special need for the assimilation of the chromatic rays. This is the case with the cat and rabbit.

The bat, hedgehog and mole, the eyes of which are exceedingly small, have no cones ; the fishes which are born and live in the waters running through deep dark caverns, it is said, have no eyes at all, or only rudimentary ones at least, and animals that are born with closed eyes have neither rods or cones until their eyes are open. The night birds have rods but no cones, they have the power therefore of appreciating the quantity of light, but not its quality ; the day birds, on the other hand, especially those that live on small insects of brilliant colors, possess, in proportion, a much larger number of cones than man or other mammalia.

The tuco-tuco, a burrowing rodent of South America, of more subterranean habit than the mole, is frequently entirely blind, and many animals which inhabit the caves of Styria and Kentucky are also without the power of vision.

The law of natural selection forces itself strongly upon our minds in connection with these facts ; nor shall we attribute this peculiar variation or disparity to any expression of original design, for we cannot with any degree of propriety assume that it was within the law that fishes should not be possessed of visual organs. The deficiency mentioned can only be ascribed to the most prominent conditional circumstance, the absence of light, the natural stimulant for the proper development of the organs. But our subject will not permit this digression, though we might draw valuable lessons in considering the varying tendencies which are likely to result in the excessive or immoderate use or disuse of the eyes.

In considering the subject thus far our interest has concentrated upon the remarkable structure and function of the retina. And especially have we noted the peculiarity of the yellow spot of Sommering. This, as before stated, is placed immediately upon the line of axis, and since

this is found to be the most sensitized portion, it is correctly inferred that in proportion to the distance from this central point does the reflected image fall, so is the sharpness of vision obscured. While this general statement is true, there is one existing spot which is entirely destitute of visual power. And, curiously enough, this is directly upon the optic disk, the place of the entrance of the optic nerve—only one-tenth of an inch from the yellow spot. That this is true may be demonstrated by a simple experiment, and which any of you may verify. Upon a card, say two by six inches, make two dots or crosses, with ink, about four inches distant from each other; close the right eye, and direct the left eye to the cross upon the right end of the card as it is held horizontally in the hand, and slowly move the card from a distance towards the eye; at first both crosses are distinctly seen, but as the image of the one on the left passes over the optic disk, it is immediately obliterated.

This is a further illustration of the functionary power of the several membranes of the retina, and the incapability of the nerve itself to coordinate the impression; and the fact is made still the more apparent when we take into consideration that the optic fibers do not at all encroach upon the yellow spot.

In closing this paper I can but very briefly allude to such parts of the eye, not herein referred to, which are included in science of *dioptrics*.

Anteriorly is the cornea a continuation of the Schlerotica, but differing from it in that it is perfectly transparent and presents a smaller convexity. Behind this is a membranous curtain called the iris, which in its turn is a continuation of the choroid. It is perforated in the center for the entrance of light, which perforation constitutes the pupil. This iris is suspended in a watery fluid called the aqueous humor; it is thereby the better able to freely contract or expand when acted upon by the muscles which control it. Again, behind these and suspended in the vitreous humor is the crystalline lens, the principal apparatus for the concentration of the light rays; this is perfectly transparent, of a double convex form, and is held in position by a ligamentous membrane. A consideration of these several tissues is essentially necessary for a complete understanding of the subject to which I have at this time sought to attract your attention.

We ought, too, to make particular reference to the laws governing ight in its transition, the phenomena of refraction, irradiation, accommodation, &c., &c., but I must reserve these for a future occasion, when, perhaps, it will be in order to announce a paper upon *Visual Optics*.

HARD RUBBER APPLIANCE FOR CONGENITAL CLEFT PALATE.

By Thomas Bryan Gunning.

Alexander Petronius, in his work entitled "De Margo Gallico," and Ambrose Paré, in his book on surgery, prove that efforts to relieve those suffering from defective palate, by applying obturators, were made over three centuries ago, and the records of the last fifty years alone show that the endeavors to supplement the congenital cleft palate have resulted in the invention of mechanical appliances which in number and variety are very remarkable; yet the "Report of the International Exhibition of 1876," in referring to the one now submitted, says: "This contrivance is a very marked improvement over all previous appliances to this distressing malformation." Now, that this simple remedy was not devised earlier is owing to mistaken views as to the movement of the muscles of the pharynx and palate, both in perfect and malformed conditions, and this, notwithstanding the investigation and study of these parts by the most distinguished physiologists and surgeons.

These mistakes will be pointed out in this paper, but the literature of this malformation is already so full, especially with the recent volume on "Harelip and Cleft Palate," by Mr. Francis Mason, F. R. C. S.,* that it is not necessary to notice all varieties of congenital cleft palate, nor need attention be given to the causes of this incomplete development in fœtal structure.

Normal conditions will be considered first.

The *constrictor muscles* of the pharynx are said to be *inserted* into the posterior median raphe, which lies against the vertebral column, whereas they *arise* on that line; that is, they are fixed at this center of the back of the pharynx, by which the inferior and middle constrictors, in deglutition, *relax* to allow the larynx and its support—the hyoid bone—to pass forward and open the way to the œsophagus.

The *superior constrictors*, which may be seen from the front of the mouth, after reaching the upper end of the raphe, are also prolonged by a fibrous aponeurosis to the basilar process of the occipital bone. They are thus firmly held up as well as back. These muscles, which form the upper part of the pharynx, pass off on each side to their insertions on

* J. & A. Churchill, London, 1877.

the *pterygo-maxillary* ligament, etc. They thus inclose the tonsils, and the insertion of the muscles which arch down from the uvula

The *superior constrictor* muscles, while thus firmly held at the back of the pharynx, and also at their terminations in front, where they join the attachment of the buccinators, which they resemble, are quite important, for they contract the fauces laterally and draw the tonsils and neighboring parts in, or let them out, as necessary.

The hard palate gives support along its back margin to the velum or soft palate, which is seen curving downward and ending at the uvula which gives insertion to a pair of small muscles—the *azygos uvulæ*—which arise on the spine of the palate bone, and pass along the front of the velum.

The *levator palati* muscle comes forward and inward on each side over the concave border of the *superior constrictor* muscle, and spreads out in the upper surface of the velum, back of the aponeurosis of the *tensor palati*, which last comes down around the hamular process, and spreads out its oponeurosis to the center of the velum and to the palate bone. The *tensores palati* make the velum tense; the *levatores palati* pull it up and back to shut off the nose, and the *azygos uvulæ* muscles antagonize them.

The uvula is also the centre of two distinct arches, formed by two pairs of muscles, which are separated below by the tonsils. The anterior arch is formed by the *palato-glossi* muscles, which are inserted into the sides of the tongue. The posterior arch is formed by the *palato-pharyngei* muscles, which go down, one on each side, their anterior fibres being inserted into the thyroid cartilage, while others pass around the sides and back of the pharynx.

In deglutition the pillars of this arch swing around upon the surface of the *superior constrictors* with great rapidity, and come together behind, the *tensores palati* muscles and *palato-glossi* acting in concert to form the arched band which shuts down against the tongue to keep the food back. The *palato-pharyngei* then act in concert with the *azygos uvulæ*, to press the food down the pharynx.

The *palato-pharyngei* are not associated with the palato-glossi in constricting the isthmus of the fauces, nor does the *superior constrictor* act in deglutition, as supposed, its attachments making it impossible that it can press the food down the pharynx.

The form of the hard palate is such that the tongue can fit it around the inside of the teeth, as in the consonant *t*. The back of the tongue

also fits against the soft palate and uvula exactly, and this closure can be maintained while the upper part of the soft palate shuts off the posterior nares. This is easily tested by pronouncing the consonant *k*, in which both the nose and mouth are shut off from the larynx, until the tongue leaves the palate to allow the vowel sound to come out, when only the passage to the nose is kept shut. This double closure is made even in *kee*, in which sound the contact for *k* is on the hard palate, instead of being back on the soft palate as in *koo*. The point of the tongue goes up in *t*, the back of the tongue in *k*, and the lower lip also goes up to form *p*, the upper lip and the hard palate being passive, and the soft palate nearly so, outside of its great function in respect to voice, which is to shut off the nose cavity in all sounds of speech and song except those containing *m* or *n*. At rest, the velum leaves the passage from the nose to the larynx open.

The malformed palate will now be spoken of.

Congenital cleft may be limited to the uvula, or to the front of the hard palate, or it may occupy any part of or extend through both soft and hard palate, involving the front teeth and alveolar procees up into the nostrils. In nearly all cases the soft palate is seen on each side. The back of the pharynx is exposed, and appears comparatively wide and flat, although each corner holds a vertical column of tissue, which in deglutition pass rapidly toward the center of the pharynx along the surface of the constrictors, which are seen to draw strongly across; while the horizontal remnants of the soft palate at the same time narrow the mesial gap. These vertical columns are the posterior pillars of the soft palate, which being ununited are drawn up by the *levator palati* of each side; but the anterior fibres of these pillars, which go to the thyroid cartilage, are seen in place against the tonsils. Each half of the uvula is drawn slightly up by a slip which comes from the *levator*, but it draws very feebly upward, the parts, except in deglutition, tending toward the sides more than up the back. Mr. Fergusson's report of a dissection, made by him, of a cleft palate in 1844, states distinctly that the *superior constrictor* was very full, and he also claimed for the muscle very decided forward action in deglutition: and his statement has hitherto been accepted almost without question.

The back of the pharynx is, however, in full view when the soft palate is cleft, and more especially so when the opening extends through the hard palate, but I have never seen any special action in the *superior constrictor*, beyond that shown in normal conditions. In 1864 I had be-

come convinced that the *superior constrictor* was incapable of any action which could prevent the use of a rigid appliance to supplement the cleft soft palate, and to the present time in no case has the hard-rubber palate failed to keep its place, to give entire satisfaction, and to improve the speech in a remarkable degree.

It is but justice to note that, judging from Mr. Mason's able work already referred to (p. 93), Sir William Fergusson's riper experience led to conclusions respecting the *superior constrictor* which are in accord with my own views, rather than with those expressed in his report of 1844.

Therefore, in brief, in view of the foregoing proposition : There being no forward action whatever of the superior constrictor muscles, a rigid plate can be worn without intermission, not only in comfort, but with improved condition of the mucous membrane, which is covered in, and of the general health, the nose being as free for breathing as in a normal condition of the parts ; while the plate also enables the wearer to utilize the muscles of the cleft velum. The palate is easily made, and being of hard rubber does not deteriorate in the mouth. It is not supported by any part of the cleft, and may thus be worn from early childhood without injury to the parts—in fact its support may even lessen the clefts.

The plate, which is held up by the teeth against the hard roof of the mouth, extends up into the cleft and thence to the back of the pharynx near the tubercle of the atlas, the end being rounded to allow the sides of the pharynx to close in during the act of swallowing. This extension into the cleft being spread out over the soft parts on each side, the ununited muscles draw up against it and close off the nasal cavity. The vowel sounds are therefore preserved from the resonance of the nose by the natural action of the muscles, while the nasal sounds are used when necessary, and the tongue is able to form all the lingual consonants, the stiffness of the hard rubber affording the best possible substitute for the muscular firmness of the natural soft palate. To apply this palate, a simple impression of the hard palate and teeth, as is usually taken for the setting of artificial teeth, is quite sufficient, the extension into the soft palate being made by fitting the gutta-percha pattern to the parts without subjecting the patient to the annoyance of obtaining a plaster impression of these sensitive and mobile organs. This palate is consequently so simple that any accomplished dentist can apply it, and the patient is therefore comparatively independent.

Early use of this artificial palate prevents unnatural action of the

tongue, such as attempts to close the cleft with the tongue when the latter should be free to act in articulation, whether in speaking or singing.

Fig. 1 gives the upper side view of an appliance for a case in which

FIG. 1.

the cleft passes through the whole length of the soft palate, but does not reach the front teeth.

Fig. 2 gives the lower front view of the plate shown in Fig. 1; when

FIG. 2.

worn, the narrow part is covered on each side by the cleft soft palate, as in Fig. 4.

Fig. 3 was taken from the cast of a large cleft through both the hard and soft palate, in a patient twenty years old. The cleft in her lip had been closed in infancy; and attempts were made to close the soft palate

after the cast was taken, but the parts did not unite. The case is peculiar in the absence of the bicuspid teeth and the *central* incisor, there being

FIG. 3.

only an irregularly-formed tooth on the mesial side of the canine, instead of two incisors.

Fig. 4 shows the hard-rubber appliance as adjusted to remedy the deformity exhibited in Fig. 3, after the wisdom-teeth and the right central had been lost through decay and the malformed tooth removed,

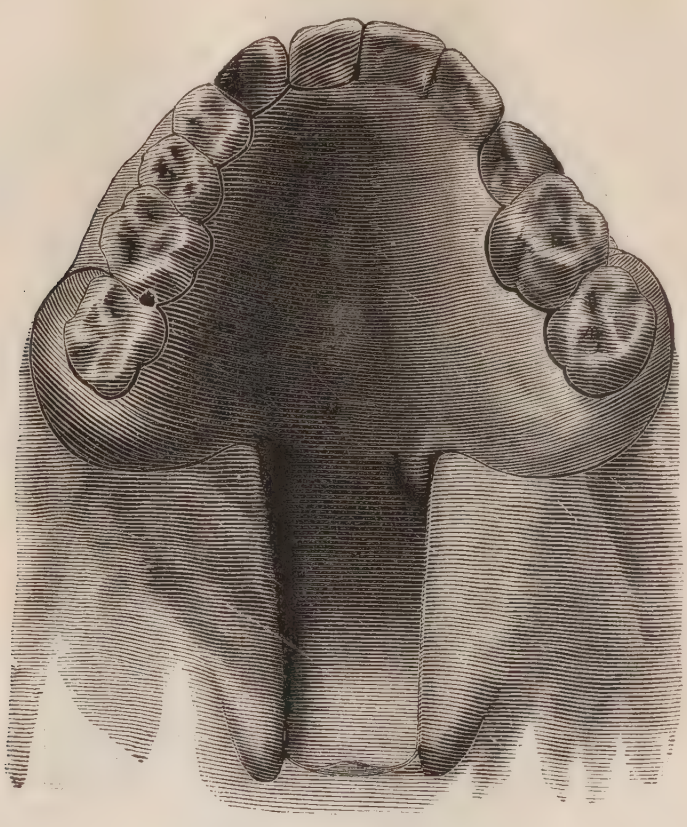
The cut was made from an impression of the plate *in situ* after it had been worn more than four years, day and night,

Deglutition is not interfered with by cleft of the palate in adults so much as articulation or speech. It was, however, necessary to explain the movement in the pharynx and soft palate in swallowing, in order to prove that they do not interfere with a rigid but properly fitted appliance. Having shown that the constrictor muscles do not close upon the food, but that they relax to let the hyoid bone and larynx go forward, and as the views are opposed to what is laid down, it is proper to show how the food gets into the stomach.

Liquids especially are drawn into the pharynx by suction, and also

pressed back by the tongue ; for solid food the pressure is proportionally increased. When the food has passed into the upper part of the pharynx, it is shut in by a band or welt, consisting of the forward portion of the

FIG. 4.



soft palate, continued down the sides, by the anterior pillars. The upper portion is formed by the action of the *tensores palati* muscles drawing their aponeuroses tight, and the *palato-glossi* coming into action, and continuing the curve down on each side of the tongue, at the same time assisting to draw the latter up against this arched band, or welt, by which the food is kept back.

It should be understood that the upper part of this welt is formed by the aponeuroses, at some distance in *front* of the *uvula*, so that the part of the soft palate behind the welt is left free. Through the middle of this, the *azygos uvulæ* muscles pass to the uvula, in the centre of the back border or arch formed by the *palato-pharyngeus* curving down on each side, and known as the posterior pillars of the soft palate. These two pairs of muscles are now inactive, as the *levatores palati* have drawn the soft palate up behind, and closed the passage to the posterior nares, while the food is shut in at the front, as before described. At the instant this is accomplished the *palato-pharyngei* act, and come together behind ; the

levatores palati relax, and the *azygos uvulæ* muscles come strongly into action, and draw the uvula and the origins of the *palato-pharyngei* rapidly forward.

The *azygos uvulæ* muscles, which pass from the spine of the hard palate to the uvula, are at this time held *down* to the tongue by the welt or band formed by the aponeuroses before mentioned, consequently they now in acting draw the orgins of the *palato-pharyngei* forward and down to the tongue; and as the insertions of these muscles extend down around the sides and back of the pharynx (crossing each other behind), they, in acting at this time, form a circular layer of muscular fibers, which converge from the circumference of the sides, and back of the pharynx, across to the insertion of the *azygos uvulæ* muscles. At this moment the muscles which arise on the inside of the chin draw the hyoid bone forcibly, the back part of the tongue is carried forward, and closes down over the epiglottis until the food falls into the œsophagus, the downward progress of the food being facilitated by the pressure of the atmosphere, which is let in by the drawing of the *azygos uvulæ* and the relaxation of the *levatores palati* muscles, while the muscles of the trunk co-operate, and the food enters the stomach. It is shown that the *tensores palati* muscles and the *palato-glossi* act in concert to form the arched band which shuts down against the tongue, and that the *palato-pharyngei* are not associated with the *palato-glossi* in constricting the isthmus of the fauces.

The foregoing explanations show that every muscle of the soft palate is active in deglutition, and that the food is effectually controlled without unreasonable action on the part of any muscle such as that generally imputed to the superior constrictor, which cannot act in deglutition, as supposed, its attachments making it impossible that it can press the food down the pharynx.—*N. Y. Medical Journal.*

GOLD CROWNS.

By Edw. Hale, Jr., D. D. S.

As there is much excitement among the profession in regard to the process of making gold crowns and attaching the same to roots, I desire through your journal to state to the dental profession that this is no new thing, having been performed in St. Louis in 1866, and presented to the

Missouri State Dental Association ; that Dr. W. N. Morrison and others have since introduced it into their practice. I therefore desire, for the benefit of the profession, to publish the mode of making and mounting gold crowns, so that they may have it without money and without price.

The first case I had was a first inferior molar, on the right side, the crown having been lost. I at first beveled the root, and then cut a slight shoulder around the root, say two lines below the margin of the gum, then took a plaster impression of root, also an articulation. After obtaining the plaster model, I built up, with wax, a crown, leaving the bevel on root exposed to the thickness of No. 24 gauge ; made a zinc die and counter from model, and struck up my crown of 22 carat gold ; strengthened it on the inside by filling in with solder, then soldered a hoop inside the crown ; finished and polished as other gold plate ; I then prepared two screws with loop ends, and fastened them in the roots, and built around them with gold up to loops, having put on the rubber dam previously ; I then prepared some os artificial, filled the crown with it, and pressed it down on the root to the shoulder, and had the teeth closed on it until it hardened.

Where the roots are in a healthy condition this process will be a far greater success than building up with foil.

For the front teeth, with the porcelain front, the profession will find the process described in the *Cosmos*, under the caption of Pivot Teeth, with diagrams, to be fastened instead of with a screw, by soldering the screw or loop inside and using the os artificial.

I do not write this to claim any notoriety, but to protect the profession from paying for a process known and used by many of the profession for years.

CONNECTICUT VALLEY DENTAL ASSOCIATION.

The Semi-Annual Meeting, for 1878, convened at the Round Hill House, Northampton, Mass., June 13th. Called to order at 12 M.—President Taylor in the chair. Drs. L. D. Shephard, A. F. Davenport and F. E. Nims, were appointed a committee on membership.

Voted,—That the Secretary's report of the annual meeting be deferred until the October meeting.

Voted,—That Art. 3d. of the Constitution be amended by inserting the words "*an Assistant Secretary*" between "Secretary" and "Treasurer."

The balance of the morning session was devoted to a "Class-Meeting," exercise, and statement of cases in practice.

Dr. NOBLE wishes to know if any one has met cases of fatal loosening of teeth, where there was no apparent cause, such as usually accompany such cases?

Pror. SHEPHARD has seen two such cases of late, and, by opening them, pulp nodules were found to be present in both cases. The theory is that the nodules lead directly to pulpitis—the pulpitis to periostitis, and that to the loosening of the teeth.

Adjourned to 2 o'clock, P. M.

AFTERNOON SESSION.

Opened at 2½ o'clock. President in the chair. The committee on membership reported favorably on the names of Drs. J. R. Bement, of Orange, Mass., F. R. Jewett, of Woodstock, Vt., and S. E. Davenport, of Northampton, Mass., who were duly elected.

Dr. GEORGE W. CRITTENDEN, of Northampton, was, by ballot, elected Assistant-Secretary.

Voted,—That the chair appoint a committee of three to report resolutions relative to the death of the late Dr. L. Parmele, of Hartford, Conn.

Prof. SHEPARD referred to the matter of the new vulcanite litigation, explaining the present status of the case, and called for subscriptions to aid in its prosecution.

The first topic announced upon the programme, "*A Cause for Dental Caries*," was then taken up, and an essay read by Dr. C. Fones, of Bridgeport, Conn. (Published in August No. of *Miscellany*.)

Dr. MILLER: In the case of the twin-sisters mentioned, did they resemble the same parent, or one the father and the other the mother?

Dr. FONES: I cannot tell. They closely resembled each other, but I noticed a difference in their general health and in the condition of their teeth.

Dr. NIMS: Would you say that insufficient use of the teeth is the cause of decay?

Dr. FONES: I would say that insufficient use is *a* cause; I would advise rubbing the teeth from fifteen to thirty minutes per day, at least.—Have seen marked improvement under that treatment.

Dr. WM. LESTER: In my opinion, the cause of dental caries has not been reached yet. Insufficient use may be *one* cause, but it is, evidently, not the only one. The early settlers of our country had good strong teeth; but the Narragansett Indians were noted for their poor teeth.—

Tribes further west have, however, very perfect teeth ; we notice also that teeth will decay at one period of a man's life with tenfold greater rapidity than at another ; also, that one tooth will be attacked and the rest remain perfect and unharmed. As to the use of hard and soft food alluded to in the paper, different races use, more or less exclusively, either hard or soft food with different results. The Scotch have good teeth, quite universally, as a race, while they make large use of the soft foods ; but the Narragansett Indians, as before stated, have very poor teeth and live on hard food. Why do we find this difference in different races? It must be that we have not yet discovered all the causes of dental caries.

Dr. C. S. Hurlbut : I have been observing, for a year or two, the difference in children's teeth in the rich and poor families. We have, in Springfield, a class on Ferry Street and a class on Maple Street. Maple Street presents better teeth than Ferry Street. In cases where the father and mother are imported from Ireland I find that, generally, they have good teeth, but that their children have poor teeth. In these cases I find that the children are usually weaned at an early age, their mothers, perhaps, working away from home, making this a necessity, and the children are fed largely upon cracker and milk. May not this account for the poor condition of their teeth? I believe that hard food is better for children than soft ; I often recommend children to chew gum to get up a gymnasium for the teeth.

Dr. Shephard : I think there is a great deal in this matter of exercise ; I have in some cases even recommended my patients to chew gum.— Would advise more corn bread of our grandfathers and hard crusts for the children.

Dr. L. C. Taylor : There are many theories of caries in the teeth, and I have listened with interest to the remarks of the gentlemen preceding me. But before going further I would like to cite one or two cases. Three brothers (farmers), two of them possessed a very strong healthy physique, but their teeth were crowded and very badly decayed (soft white teeth). The other was a cripple in almost every sense of the word, except he possessed a good head, large arch and a perfect set of teeth, with the exception of a few fissure cavities. A friend of mine had the privilege of examining some 260 skulls at the prehistoric rooms at Washington, of full blooded Indians. Not one showed signs of irregularity, and in very few instances were there any marks of decay. He also examined many of the mixed races, and in a majority of cases did he find the teeth crowded (not always irregular), signs that the gums

were diseased, and a large percentage of decay. Wherever there is a mixture of blood, the patient is apt to partake of the mouth of the one and teeth of the other parent, hence we have the large and small born mixture, and the result must be, in very many instances, a crowded state of the teeth, chronic inflamation of the gums, causing a fetid secretion to omit therefrom, that will rust through enamel when permitted to remain in contact. In my opinion the fevered condition of the soft parts is one of the principle causes of approximate decay.

Dr. NOBLE : I think one reason why the Indians have better teeth, generally, than other races is because the children are brought into the world under such conditions as to ensure the early death of the weak and imperfectly developed. In other words the weak and sickly ones are weeded out by the exposures and hardships incident to their manner of life, and only the strong and perfectly developed live and reproduce. The same is in part, at least, true in regard to our ancestors ; but at the present time under the advanced condition of our civilization and scientific knowledge, the lives of those children who are constitutionally weak and imperfectly formed, are prolonged, and they in turn reproduce after their kind, and the result is as we find it.

Dr. D. MURLESS : In one of my visits to New York, I had occasion to examine several Indian skulls, and those of other uncivilized races, and noticed that in those cases the jaws were large and well formed. Think that our present civilization tends to produce a narrow jaw and a crowded condition of the teeth.

Dr. NIMS : I had occasion some two years since, to fill some teeth for a returned missionary, who spent several years in Burmah. He remarked that the natives rarely if ever, had decayed teeth, but Americans going there to live continued to have poor teeth.

Prof. SHEPARD : The study of skulls is sometimes liable to mislead. It is an undoubted fact, that the teeth of one hundred years ago were better than those of the present generation. It would, perhaps, be difficult to say which, of the many causes, is the most prominent. The soft food of the last thirty years may have had something to do with it. He had noticed in his own family that there is a dislike for crusts. I like the essay very much. There can be no doubt at all, but exercise of the teeth has a beneficial effect. But I wish to criticise one point made in reference to the early decay of the six year molars. If I understood the essayist, he claims that the lack of exercise, or insufficient use of these teeth, is a prominent cause of decay. The six year molars are intended

by nature, for use until the bicuspids and twelve year molars, are erupted and consequently they have more work to do than the other teeth. The matter of nutrition lies back of that, and the trouble is more chargeable to the lack of a proper nutrition, than to the lack of proper use or exercise. Then again, the children are not brought under the eye of the dentist soon enough They are often nearly gone before the dentist sees them. I think there is little more difficulty in saving the six year molars, than other teeth, if we can see them soon enough. They should be attended to as soon as they need—treating them temporarily if need be. The health of the gum is also to be taken into account, and it is something that every one notices, as dependent upon mastication to a very great extent. If we could go back to the hard food of fifty years ago, I am not sure but that we should gain as great benefit, as by going on to the Grahams.

Dr. Fones : I did not mean that my theory regarding the insufficient use of the teeth was to be taken as *the* cause of dental caries, as Dr. Lester seems to think, but *a* cause. After a great deal of investigation in reference to this matter, I have become firmly convinced that such is the case. I cannot but believe that the effect of crusts and other hard substances would be beneficial. Those who have traveled among the Indians much notice that they use hard food, and that their teeth, while much worn down, are, nevertheless, good and generally free from decay, and that the gums are in perfectly healthy condition. Then again, as to *rubbing* the teeth when they are sensitive and otherwise diseased, argued that they are thereby stimulated to assimilate more nourishment—urged the necessity of cultivating the habit of eating slowly and thoroughly masticating the food. Investigations in regard to the Irish show that they are in the habit of eating very rapidly, and that they live very generally on the soft foods.

Dr. Lester : I did not wish at all to take exceptions to the theory advanced by Dr. Fones in his paper ; but it seems to me that the cause of caries in the teeth is, in the main, in the diet ; hot foods, sweets, rapid eating, &c., are largely responsible for dental caries.

Dr. Miller : I do not like to drop the subject until one other cause is alluded to, and that is the lack of cleanliness, which I believe to be the *great cause* of dental caries. I recognize all of the possible causes named, but this I think one of the most important. Several cases have been alluded to where people have good sets of teeth that are never brushed or cleansed in any way ; but we must not reason from that that

the lack of cleanliness promotes good teeth. They have good teeth in spite of this state of things, but it is because they possess a very superior vitality.

Voted,—To proceed to the second topic, to wit, "The New Departure—Review of its claims with especial consideration of the question, to what extent the conscientious dentist shall adopt its principles in his practice."

Essay by Prof. L. D. SHEPARD, of Boston.

After the reading of which the convention adjourned until evening.

EVENING SESSION.

Called to order at 8 o'clock. Chair appointed, as committee on resolutions, Drs. C. Fones, J. H. Smith, and F. D. Murless.

The paper by Prof. Shepard was then taken up for discussion.

Dr. SEARLE : I am not certain that the electro-galvanic theory is well sustained. Teeth seem to be preserved by filling in proportion to the perfection of the adaptation of the filling to the surface, or wall, of the cavity. If, in consequence of the non-adaptibility of the material, or the want of care and skill in applying it, the filling is so imperfect that moisture gains admission between the filling and the dentine, by decomposition of that moisture an acid may be formed sufficient to produce new decay. Dr. Palmer says that the presence of moisture is necessary in order to set up electro-galvanic action. The presence of moisture implies imperfect workmanship ; and chemical changes in this moisture accounts for the presence of acid quite as well as the electro-galvanic theory. New decay usually appears at one or more points under a filling, and not equally on all sides of it, and always at those points where the filling is imperfect.

Dr. SHEPARD : Do you not find acids on all points of the teeth and in different parts without reference to the rest, and may not a battery be set up at this particular point of decay and none other?

Dr. SEARLE : What you call acid I call moisture, capable of forming an acid when imperfection of workmanship and other circumstances furnish the right conditions. I regard gutta-percha the best material for prevention of decay, so long as it lasts, on account of its plasticity.

Dr. NOBLE : I should like to ask if there is not a change takes place in gutta-percha—say in three or four hours? I think it grows harder. I should like to ask Prof. Shepard to state how he packs it?

Prof. SHEPARD : I use small pellets and a sharp-pointed instrument.—Think it a mistake to use a large instrument. The softer kinds I heat on

a soap-stone, the harder over the flame. I never use a piece after it has been once heated ; I trim the filling with a hot instrument. Great care should be taken to not displace the first piece, or pieces, after they are introduced and placed in the cavity, else you will not get a perfect adaptation or perfect joint ; these first become hardened, and if they are moved in the *slightest degree* the adaptation will not be perfect and cannot be again adjusted. This, I think, accounts for a great many failures with this material. Again, the cavity should only be filled just full, so as to require almost no finishing.

Dr. SEARLE : I cool my filling, and trim it with a sharp knife or other instrument ; I heat a large piece and cut off as much as I care to use ; I do not think that it hurts it to heat it any number of times, always provided that it is not overheated.

Dr. FONES : I am very much in favor of Hill's Stopping—it is one of my sheet-anchors. I try to heat it so that it will stick to the walls of the cavity, using a small instrument to place it in position. I do not see that it would be injured by re-heating. The great benefit to be derived from its use, as it seems to me, is from the fact that the cavity may be so easily *hermetically sealed*, thus excluding all moisture.

Dr. SEARLE : Does not the quick lime in it act favorably by its alkalinity ?

Dr. FONES : I have never noticed, but I doubt it. I finish with a wet disk, run as rapidly as possible. In regard to the "New Departure" theory, I don't know much about galvanic action. The successful dentist, as I regard it, is one who can decide and use such material as the varied cases require. *Judgment* must be called into requisition in every case. I adopt this theory in my own practice, endeavoring to select such material for use in each case as is, in my best judgment, best adapted to the conditions of the tooth and the environments of the cavity ; but I still believe that gold will do as good service in the average mouth as any other material in general use.

Dr. C. S. HURLBUT : Every practitioner should be eclectic in his practice—should use his judgment and be discreet. One, of course, cannot deal with every person alike. There are some cases in which other materials do better than gold ; I don't believe that amalgam is the best material ; I don't believe that we had better throw away gold ; I fear the younger dentists are using too much amalgam, and I do not think that this practice will "pass out." Would it not be well to be cautious ?

Dr. MILLER : I am much pleased with the essay read by Prof. Shep-

ard, upon the subject of the "New Departure." I consider it a good, fair and lucid statement of the whole question, and I am very grateful to him for it; I believe that it is the true view to take, and that we should, as he advises, move with caution. I, for one, am not yet prepared to give up gold foil.

Dr. SEARLE: Did you ever save teeth with gold that you could not have saved with amalgam?

Dr. MILLER: Yes; the amalgam failed at the necks of the teeth.

Dr. VINCENT: I have refilled tooth after tooth with gold, where amalgam had failed that was put in by other dentists.

Dr. NOBLE: There are a great many cavities, like those in the grinding surface of molars and biscupids, that I can save better with gold than with amalgam. With gold I can make a sort of screw head-shaped filling, thus protecting the edges of the cavity; but with amalgam the edges of the filling so made would soon break off and form a shoulder or pocket for the retention of food, sooner or later resulting in a leakage. If amalgam possessed the solid qualities of gold, then we should have the thing we want.

Dr. DERBY: I suppose our experiences in filling are about the same. We have seen cases of bicuspids that were badly decayed filled with amalgam, whose edges, after a time, become defective and finally break down. Now, if these cases had been filled with gold, in my opinion it would have been better, as the gold would have hammered itself out, as it were, so as to protect the edges.

Prof. SHEPARD: The trouble with amalgam is its great tendency to resume the globular form in becoming hard, and, of course, a quicksetting amalgam is the best. The softer you prepare the amalgam the greater the tendency to assume the globular form; the harder we work it, the less likely are we to have it fail on account of this tendency. A quick setting is better than a slow setting amalgam. I think it a good idea to put a piece of old amalgam into a large cavity with the new, to correct this tendency. A great mistake is made in not burnishing the fillings after it is hard; I always make it a point to see my patients after the filling has become hard, so as to properly finish it.

Dr. STOCKWELL: By "squeezing out" the excess of mercury, in order to secure the desirable dryness, or hardness, of the amalgam you speak of, do you not incur the risk of destroying the equilibrium of the metals, the tin and gold being more readily taken up and carried out with the mercury?

Dr. SHEPARD: I think quite likely that is the case. The better way is to add sufficient metal to bring the amalgam to the right consistency—or it may be, perhaps, more safely mixed by weight.

Dr. TAYLOR: Would you say that the oxidation of these fillings was the effect of the acidity, or alkalinity of the saliva?

Dr. SHEPARD: I will correct myself, and say that it is a sulphuret of silver.

Adjourned to 8 A. M. second day.

SECOND DAY.

MORNING SESSION.

Opened at 9 A. M.

The first hour of this session, was occupied by Dr. C. Stoddard Smith, of Newark, N. J., in the exemplification of Celluloid, as a base for artificial teeth. After which it was

Voted,—to take up Miscellaneous Business.

The Committee on Membership, reported favorably upon the names of Drs. J. Hemenway, of Athol, Mass., D. W. Ainsworth, of Ware, Mass., V. W. Leech, of Amherst Mass., C. D. Carter, of Springfield, Mass., and R. D. Brown, of Florence, Mass., all of whom were duly elected.

The Committee on Resolutions reported the following, to wit:

Whereas,—It has pleased an all-wise and Heavenly Father, to remove from our midst Dr. L. Parmele, of Hartford, Conn., ex-Vice-President and member of this Society, therefore:

Resolved,—That while we mourn his decease, we shall cherish his memory as living an upright and blameless life, and maintaining an honorable position in the profession for nearly half a century.

Resolved,—That a copy of these resolutions be presented to his family, and also published with our proceedings.

C. FONES,
J. H. SMITH,
F. T. MURLESS. } *Com.*

"REGULATING TEETH,"

was then taken up, and an essay read by Dr. C. S. Hurlbut, of Springfield, Mass.

Models were presented, exhibiting several cases treated, and their manipulation explained by the essayist.

An informal discussion followed, wherein some portions of the treatment in these cases were more or less criticised by several members, which called out replies in defence by Dr. Hurlbut.

Prof. SHEPARD advocated the practice of paid consultations in these cases, in the same manner as is practised by the medical profession. Thought this practice would serve to strengthen the confidence of the patient in the operator, and at the same time would ensure a more careful and studied advice on the part of the one consulted. Besides, it is due to one who may have made this matter a specialty, inasmuch as he becomes, in a measure at least, responsible for results, especially if his advice is followed. One cannot afford, and ought not to be expected, to give advice in these cases without remuneration, especially where the advice is the result of a study and examination sufficient to make it at all valuable. The fee for consultation should, of course, be paid by the patient. He also presented the advantages to be gained by the use of cotton tape as a means of wedging the teeth apart where space is required in filling, as well as in regulating teeth, and illustrated various ways of applying it, as adopted by himself in his own practice. He regards the use of rubber as cruel to the patient, and entirely needless.

Dr. NOBLE has used tape for separating teeth in his practice for many years, and regards it the best practice.

Dr. D. MURLESS claims that the use of rubber is not cruel. Plenty of room can be obtained with rubber, to operate before inflammation takes place and the teeth become sore. Can obtain all the room necessary in three or four hours, while with cotton it requires two or three days.

Dr. FONES uses wood on the physiological law of labor and rest. The tape method is new to me, and I propose to try it.

Under the head of

"MISCELLANEOUS TOPICS,"

Dr. SEARLE inquired if any one had had any trouble caused by the cracking of blocks of teeth in vulcanizing. He had experienced a good deal of annoyance in the matter, but thinks he has had less trouble since he had decreased the heat and increased the time in vulcanizing. He had complained to Mr. White, who reported that it was caused by the blocks being too thin.

Dr. MORGAN : I have been troubled in the past to a considerable extent, but I then laid it to the rubber ; I was then using the Johnson & Lund whalebone rubber, which is the best in my opinion. I have taken cases

out of the flask, and while examining it have seen it crack across one of the front blocks ; I think it is caused by an unequal pressure.

Dr. Fones : I think there is a difference in rubber—the more earthy matter there is in it the less liable it is to contract.

Adjourned, to meet at Springfield in October, subject to the call of the Executive Committee.

C. T. STOCKWELL, *Secretary.*

AMERICAN DENTAL ASSOCIATION—EIGHTEENTH ANNUAL MEETING.

OFFICERS :

President—F. H. Rehwinkle.
First Vice-President—L. D. Shepard.
Second Vice-President—George T. Barker.
Corresponding Secretary—M. H. Webb.
Recording Secretary—M. S. Dean.
Treasurer—W. H. Goddard.

EXECUTIVE COMMITTEE :

W. H. Morgan, Chairman.
M. H. Webb, Secretary.

Committee on Appliances—Thomas Fillebrown (Chairman), A. L. Northrup, T. L. Buckingham.

Committee on Credentials—L. D. Shepard (Chairman), M. H. Webb, J. N. Crouse.

Committee on Nominations—Homer Judd (Chairman), W. H. Morgan, G. H. Cushing.

The eighteenth annual session of the American Dental Association opened at Grant's Hall, Niagara Falls, Tuesday, Aug. 6th, the President, Dr. F. H. Rehwinkle, of Chillicothe, O., in the chair, and Dr. M. S. Dean, of Chicago, the Recording Secretary, at his post of duty. At ten o'clock the Association was called to order, and the proceedings opened with prayer by Dr. W. H. Morgan, of Nashville. Tenn.

Following the calling of the roll of qualified delegates by the Treasurer, Dr. W. H. Goddard, of Louisville, Ky., the minutes of the final session of the last annual meeting, were read and approved.

Dr. Thomas Fillebrown, of Portland, Me., Chairman of the Committee on Programme, reported the following

ORDER OF BUSINESS:

Organization of the meeting, 10 A. M.
Calling of the roll of qualified members.
Reading of the minutes, and action thereon.
Meeting of the Executive Committee, filling of vacancies therein, examination of credentials, and payment of dues, 8 A. M.
Reports of officers and Special Committees.
The reading and consideration of the stated annual reports from the Standing Committees, together with the volunteer papers, upon the same subjects, in their consecutive order.
Report of Executive Committee.
Balloting for the place of the next annual meeting.
Election of officers and three members of Executive Committee.
Appointment of Standing Committees.
Instructions to the Permanent Committees.
Unfinished, new, and miscellaneous business.
Adjournment.
Time of session 10 A. M. until 2 P. M. and 7½ P. M. until adjournment.

Dr. FREEMAN, of Buffalo, moved that instead of an evening session, an afternoon session be held from 4:30 to 8 P. M. Lost.

The report of the Committee was then adopted.

Under the head of "Reports of Officers and Special Committees," the committee on credentials reported progress.

The Secretary read a communication from Dr. J. J. Birge, of San Francisco, tendering his resignation as a member, because of his being so far removed from the Atlantic States.

On motion, the resignation was accepted.

The Executive Committee, through Dr. Shepard, of Boston, reported that for absentees, they had substituted Dr. G. V. Black, of Jacksonville, Ill., on the Committee on Appliances, and Dr. C. N. Peirce, of Philadelphia, on that of nominations.

Dr G. H. CUSHING, of Chicago, moved the adoption of the following resolution offered at the last meeting:

Resolved, That Dentists not resident in the United States, who may be present, and whose names may be approved by the Executive Committee, are hereby invited to seats upon the floor, and to participate in the discussions.

The Corresponding Secretary, Dr. Marshall H. Webb, made the following report:

Your Corresponding Secretary would respectfully report that he has

attended to the duties assigned him, notified the gentlemen who were elected honorary members of the Association, viz. : John Tomes, M. R. C. S. ; Charles S. Tomes, M. A. M. R. C. S. ; J. Smith Turner, M. R. C. S. ; George Van Langadorff, D. D. S. ; E. Megitot, M. D. ; Adolph Peterman, D. D. S. ; Mordant Stevens, M. D. D. D. S., M. R. C. S., and Mr. Wedl. A reply has been received from each of the gentlemen named, excepting John Tomes.

In compliance with the resolution passed at the last meeting of the Association, your Corresponding Secretary, in connection with McQuillen, has seen to the getting up of a certificate of membership, a copy of which is here presented.

MARSHALL H. WEBB, *Cor. Sec.*

Dr. CUSHING moved the adoption of the following amendment to Article III, Section 4, offered at the last meeting :

All delegates shall be practitioners of dentistry ; they shall receive their appointment only from permanently organized State Dental Societies and Dental Colleges.

On motion, action on this amendment was indefinitely postponed.

A further amendment to Section 1 of Article III, "that each local society may send one delegate for every fifteen of its active members," was voted upon and lost.

Dr. R. W. HUNT, of Washington, D. C., presented the following majority report of the Special Committees on Sections :

THE REPORT.

To the American Dental Association :

The action of the American Dental Association in adopting the following resolution has been interpreted by the enlarged committee as a desire that the subject should be more maturely considered, and the results of that consideration laid before the Association in a more exhaustive report and a more detailed and perfected plan :

"*Resolved*, That the committee be increased to ten members, and that the report presented by the committee of three be recommitted to said committee for amendment or reconsideration, and that they be instructed to print the results of their deliberations, and that a copy be mailed to each member of the Association at least one month before the next annual meeting."

Acting upon this interpretation, the committee will endeavor to set forth the advantages and objections attending the introduction of this very material change in the working of the Association On both these points it will be necessary to compare the probable working and results of the proposed system of permanent sections with the known and tried

ones of the present plan of annual committees. The committee cannot do better in that direction than to quote here the second and third paragraphs of the original report, as follows :

"The principle of division of labor and concentration of effort, so extensively adopted in the successful prosecution of ends in so many business interests, and that have been so happily practicalized in this body, would seem to apply with peculiar force to our investigations and researches, since we have before us a field so wide and embracing so many branches of science that no one man can hope to master them all, or even a considerable number of them, and at the same time pursue the practice of his profession.

"It can, therefore, hardly be doubted that the members of this Association can accomplish more for the advancement of the interests of our profession by persistently pursuing scientific inquiries, as connected therewith, in a single direction, or on a limited number of subjects, than by the present system of preparing papers or essays year after year, and each year on different subjects."

This general comparison may be carried more into detail by saying that, by the plan of annual committees, members are appointed thereon in many instances without having been consulted, and thus placed in charge of subjects not consonant with their tastes or inclinations, and with which they are frequently not familiar.

The papers prepared by the committees thus constituted, although of great value in themselves as embodying the views and opinions of prominent gentlemen of our profession, necessarily contain much of repetition and lose much of force and efficiency by reason of the unavoidable want of system in the treatment and presentation of the various subjects and the equally unavoidable aspect which they bear of being but the expression of individual views and opinions.

It is believed that in the proposed system of permanent sections, if properly organized and operated, will be found a remedy for this and other objections. Each member of the Association will be free to select for himself that channel of study and labor which his acquirements, his present knowledge, his taste and predilections or his desire for special instructions may lead him to prefer. Each section, being permanent in its membership and continuous from year to year, can present to the Association the results of its labors so systematized and well digested as to be most effective, and the talent and ability of those members who will naturally gravitate to each section will, if not immediately, yet in a short time, give to its dictum on the subject under its charge that type of authority that is now accorded to the writings of Agassiz on Natural His-

tory, Liebeg on Chemistry, Huxley, Leidy, and Marsh on Comparative Anatomy and Physiology, Tyndall on Physics, etc.

While each section is pursuing the investigation of its particular subject in a thorough and exhaustive manner, in a scientific point of view, its members will in turn receive the benefits of similar labors of each of the other sections, thus making the results of the special researches of each section and individual enure more effectively to the benefit of the whole Association and the profession at large.

The objections to the adoption of the system of permanent sections would seem to lie, first, in the difficulty always attending the introduction and organization of new machinery ; and, second, in the doubt that may arise whether the members, after uniting with a section, would work so as to make its labors effective. These objections, however, would derive all their weight and force from a want of disposition on the part of the members, and not from any inherent defect or disadvantage of the system itself. Should it present itself in so favorable an aspect as to lead to its adoption, there would be certainly little difficulty, after its details are determined, in carrying it into practical operation. This would simply require willing, intelligent, and properly directed effort.

The first step would be the formation of the sections, which is accomplished by each member choosing his subject or special field of labor and enrolling his name in the section having charge of it. The next would be the organization of the sections by the election of a chairman, and, if desired, other officers of each section.

Upon this chairman, as its quasi executive officer, would naturally devolve the duty of conducting and supervising the work of the section—a trust which it is necessary in all large or small organizations to repose in some one—and this duty and trust always carries with it a greater or less amount of labor. The method of investigation and preparation of the work of the sections for report to the Association must, from the diversity of the subjects and manner of handling them, be left to a great extent to the judgment of each section, although there should be a general similarity of plan for all.

It is here suggested that the chairman of each section divide his subject into as many parts or heads as a proper analysis or dissection will permit, and by correspondence or otherwise obtain the conclusions of each member of his section upon all or any one or more of these parts, and embody these conclusions with his own in the report prepared by him for the Association. Of course, these conclusions should be based

on careful investigation and supported by facts, because no proposition or statement has any value in a scientific point of view unless so based and supported ; and one great objection in the introduction and adoption of this system is to bring the diverse views, theories and propositions which are at this time, or may in future, come before our profession, to that test, and thus establish and fortify the true, and eliminate those having no foundation.

It would probably be well for this Association to constitute the chairman of the several sections a committee to mature and adopt some general plan, and, as far as they can, the details of the work of the sections.

While it would be desirable that all the members of the Association should have the benefit of the discussions elicited in the sections while making up the reports, yet that is impossible. As now, the consideration of the report made would afford the best occasion for profitable discussion and instruction.

It will be readily understood that while the treatment of the past history and former developments of a subject may make the first two or three reports of a section lengthy, yet, when they shall have been disposed of, the current condition of such subject will probably furnish matter for only brief reports, and at that time, therefore, the number of divisions and sections reported in the following resolutions will not be too great, though at present it may seem cumbersome.

Resolved, That the membership of this Association be, and is hereby, divided into twelve different sections, each section to be composed of such members as may elect to unite and form that section.

Resolved, That it shall be the duty of each member of this Association to connect himself with some one of these sections, but that he shall be free to follow his own preferences as to the particular channel in which he will labor, and may, if he so desires, be a member of two or more sections.

Resolved, That the members of each section shall at each annual meeting of the Association, immediately after the regular election of officers, elect in turn and in the order named, a chairman and such other officers as they may see fit, the names of the members of each section being read and the same tellers canvassing the ballot. And it shall be the duty of the chairman so elected to see that the labors of his section are conducted in the manner calculated to secure the best results.

Resolved, That each section shall have charge of one of the following divisions of the subjects or branches essential to scientific dentistry, and through its chairman, or such other member as it may select, report upon the same to the Association at each annual meeting, in the order in which they are named :

1. Operative Dentistry or Dental Surgery.
2. Artificial Dentistry.
3. Anatomy and Physiology.
4. Histology and Microscopy.
5. Etiology.
6. Pathology and Therapeutics.
7. Chemistry and Materia Medica.
8. Metallurgy and Chemistry of the Metals.
9. Dental Education.
10. Dental Literature.
11. Dental Nomenclature.
12. Dental Appliances.

Resolved, That after the several sections shall have been fully organized and in working condition, it shall be the duty of each chairman to furnish the latest and best information in the possession of his section upon any point connected with its subject, to any member of another section who, through the chairman of his own section, may apply to him for such information.

Respectfully submitted,

R. Finley Hunt,
W. H. Atkinson,
H. A. Smith,
C. W. Spalding,
Homer Judd,
W. H. Morgan,
J. H. McQuillen,
Committee.

Dr. W. H. Atkinson of New York, from the committee on Dental Nomenclature and Terminology, presented a report giving a few illustrations, suggestions, etc., for the improvement of technical terms in use in the profession. The committee recommended that the name of section two be changed from Dental Nomenclature to Nomenclatium, and the correlation of dentistry with science at large.

Discussion being in order, remarks endorsing the views of Dr. Atkinson were made by Dr. John Allen, of New York.

Dr. Thomas Fillebrown moved that all dentists and physicians not members of the association, be invited to seats upon the floor. Carried.

The recommendation from the committee on nomenclature was laid on the table, until the committee on sections came up for disposition.

After further remarks from Dr. J. Taft, of Cincinnati, O., the subject of nomenclature was passed.

The following proposed amendment to section 4, article III of the constitution, offered by Dr. D. C. Hauxhurst, of Battle Creek, Mich.,

and laid over a year ago, was, by request of Dr. J. H. McQuillen, of Philadelphia, taken up for action.

No dental college shall be eligible to representation in this Association which does not require two courses of lectures as a condition of graduation.

Dr. Fillebrown moved its adoption.

Dr. Hunt earnestly opposed this motion and the amendment.

Dr. A. O. Rawls, of Lexington, Ky., moved that action be postponed until the subject of dental education was brought up for consideration.

After remarks by Dr. H. A. Smith, of Cincinnati, Dr. Sheppard and Dr. C. W Spaulding, of St. Louis, Dr. Klump, of Williamsport rose to a point of order, claiming that debate was not in order.

The chair decided the point well taken under the rules.

Dr. W. H. Morgan, of Nashville, Tenn., briefly addressed the convention, and the question being taken on the motion of Dr. Rawlins, it was lost.

The convention was then addressed by Dr. Atkinson, Dr. I. J. Weatherby, of Boston, Dr. McQuillen, Dr. Spalding, Dr. J. Foster Flagg, C. N. Pierce, and Prof. T. L. Buckingham of Philadelphia, Dr. Hunt, Dr. Morgan, Prof. Frank Abbott of New York, Dr. G. B. McDonald of Pennsylvania, and Dr. Rawls.

A majority of these gentlemen expressed themselves as conscientiously opposed to stipulating a stated time for graduation, as it was arbitrary.

They favored the adoption of a high standard and a course of examination which should entitle an applicant to the degree, provided he passed a perfect examination and proved that he was equal to the grade of proficiency demanded.

Dr. George H. Cushing of Chicago moved that the subject matter be committed to a committee of three. Carried.

The Chair appointed as said committee, Doctors Morgan, Fillmore and Black.

At two o'clock the Convention adjourned until evening.

THE PATHOLOGICAL AND PSYCHOLOGICAL ACTION OF OPIUM, AND ITS EFFECTS UPON THE HUMAN RACE—TREATMENT BY ELECTRICITY AND CAFFEINE

By Ed. F. Mann, M. D., Sunny Side, Washington Heights, N. Y.

The early existence and use of the poppy is made known to us through the ancient mythologies of the Greeks and Romans. The Romans

looked upon the plant as a gift from Ceres, the goddess of corn, and she is described as having a sceptre in one hand, and in the other the symbolic capsule. It was the ancient custom to paint Soranus as reposing upon a bed of snowy poppies. Catullus and Tibellus also speak of this plant, while Homer speaks of the poppy as among the familiar garden flowers. Diodorus says that the women of Thebes were acquainted with a herb which, from its properties, leads us to suspect that it was the poppy. Pliny also understood its virtues, and Livy speaks of it as being in the gardens of Tarquinius Superbus, which shows that it was known to the Romans at least five centuries before the Christian era. Hippocrates also was well acquainted with its virtues. The *nepenthes* of the Odyssey, and the ancient cordials, probably contained opium and also Indian hemp, which imparted the intoxicating and exhilarating inspirations to such beverages.

Opium was used medicinally by the Greek physicians centuries before the Christian era, and Dioscorides and others describe the mode in which it was obtained from the capsules of the plant. In 1228, we find the use of opium mentioned by the physician to Pope Nicholas IV. It was sent afterwards with camphor, etc., as a present to royal personages; and in 1516 it had become an article of commerce. In a letter to the king of Portugal, it is described as in great demand among the rich and noble people in Egypt and Cambay, where the consumption was limited only by the price.

Its use as a luxury was communicated by the Arabs and Persians to the other Eastern nations, and the rapid recourse to some form of opium was contemporaneous with the spread of Islamism. From being known in China as a medicinal substance in the ninth century, it has lately become a means of sensual indulgence, and constitutes a distinct and lucrative department of trade.

About 3,000,000 Chinese smoke opium, and in the island of Singapore, 15,000 out of a population of 70,000 are similarly addicted. It is recorded that, calculating the consumption of 299 smokers in Singapore, each smoker consumed what is equivalent to 50 grains of crude opium per day. When used to excess, it is said that 116 grains have been consumed in this manner. One hundred pounds has been stated to be the monthly supply for the opium inebriates of the island. The opium traffic with China is so immense, that as far back as 1854 the Chinese paid the East India Company, for opium alone, a sum exceeding in valuation the total export of their teas and silks together.

The effect of opium is invariably, although in different degrees, agreeable, soothing, stimulating and elevating, culminating, as opium smokers describe, in perfect bliss and complete oblivion. This state, however, is soon succeeded by languor, lassitude, loathing of food, aching of the limbs, gloom and indefinable wretchedness, and these sensations are only relieved by increased indulgence, which gradually results in a complete demoralization of the moral as well as the physical nature.

In China, the opium used for smoking purposes is prepared with the greatest care from the crude gum, thus obtaining an extract or "Tschaudú," which is about 54 per cent. of the original gum, and which yields more pronounced exhilarant and sedative properties, with a corresponding reduction of the narcotic element. In the region of the Bosphorus there is used a confection, of a lozenge form, and these lozenges are sold publicly. At Cairo, a conserve is sold, which, in addition to opium, contains hyoscyamus; while in India, the same confection contains Indian hemp or nux vomica. In Turkey, the natives add to the gum opium ten per cent of mercury to intensify the stimulation.

Morphine, the alkaloid extract of opium, contains the sedative property of opium, but the narcotic power is lessened, and it is, therefore, much used by ladies, especially in England. Laudanum is the spirituous solution of opium, and in China is limited to the higher classes; while with us it is used by the lower classes to whom druggists are in the habit of selling a diluted laudanum for the purposes of drink. McMunn's elixir, which is a denarcotized laudanum prepared with ether, is much used; as is also paregoric, which is extensively taken by children of a larger growth than those for whom it was originally intended; while Winslow's soothing syrup which, when analyzed, gives, I believe, *one grain* of morphia to the ounce of the liquid—thereby giving, if the directions on the bottles are followed, a great deal more than can be safely given an infant—has succeeded in *soothing* many a little one into everlasting quiet.

In China, opium is universally smoked; while in Persia, the lozenges before alluded to are swallowed. In smoking the opium, the lungs are inflated as much as possible, and after retaining the smoke some time—practice making perfect—the fumes are inhaled through the nostrils. In this way, a single whiff penetrates throughout the air-cells of the lungs, and in a few mniutes, up to two hours, in old *habitués*, the coveted influence is obtained, and lasts from three to five hours as the case may be.

From the dens of the opium-shops in cities, where the lowest classes congregate, to the boudoirs of the rich, with the gilded opium pipe,

the same intoxicating bliss is sought for, and the same curse of destruction of mental and physical health rewards alike the rich and the beggar. From the time when the indescribably entrancing repose following the use of opium occurs, may generally be dated the bondage to the drug, which eventuates in ruined health, prostrated business and blasted hopes.

The action of opium suspends and permanently enfeebles volition and conscience. Whether this is due to its agency upon cerebral structure—that is, whether it is imbibed by the nervous tissues, and creates, by such imbibition, changes incompatible with pain, for instance, or whether by its action on the brain the will directs the attention of its influence to structural or moral suffering as the case may be—is a very difficult problem for psychologists. It would seem that the suspension and enfeeblement of the moral faculties produced by opium, while the intellectual faculties remain unimpaired, should depend rather upon a relation between opium and sensibility and consciousness, than upon the relation which it has to cerebral substance. One very disagreeable symptom which opium-eaters suffer from, is a general hyperæsthesia ; and the painful nervous susceptibility often becomes so acute that even a jar from a footstep becomes unendurable ; while the neuralgic twinges that result from opium, shoot along the nerves until the unhappy sufferers—body and mind alike—are shattered from the prolonged torture. When a man has once yielded himself up to the mastery of this appetite, the soul becomes contaminated, the moral sense obliterated, and all the finer susceptibilities and nobler aspirations decline and fade away ; and the aim in life becomes erratic and purposeless, and the habitué has the misery and curse of seeing his children inherit the physical expression of general enervation and the mental aspect of dullness and idiocy. These children, with their feeble, broken-down constitutions, inevitably fill, as they grow up, our prisons, almshouses and insane asylums. A great many infants who naturally inherit fairly good constitutions from their parents, are poisoned by that nemesis of the nursery, paregoric, and the early mortality of such children with the records of *post mortems*, reveal that this results in serous effusion of the brain, and in some cases even marked degeneration of brain substance itself.

Opium is much resorted to by literary men for the transient exhalation of the imaginative faculty ; but the intellectual fire, which is regularly fed as it flags with stimulants and narcotics, will ere long die out, never to be relighted.

One of the saddest things connected with this habit, is the fact that

voluntary renunciation of opium by one who has become addicted to its use is unknown to the profession. Opium-eaters make many well-intentioned resolves toward reform, but they are invariably frustrated by a revival of the appetite, and a relapse follows.

It is a startling fact, but a true one, nevertheless, that one-fifth of the opium sold by retail druggists would cover all the prescriptions of physicians in this country. It is taken generally to stimulate, but not to disturb the mind; to soothe irritability; to induce placidity; pleasurable feelings; gentle and friendly relations; to restore the strength and activity enfeebled by previous indulgence, and to render the partaker himself capable of discharging his duties and occupations by imparting an artificial and temporary health, which at once deceives the victim and baffles the keenest scrutiny. A wan and withered man or woman will apply for treatment, with bent figure, slow step, tremulous hand, feature pale and haggard, eyes sunken and lustreless, and the patient would appear to the ordinary observer as a man or a woman tottering on the verge of life.—Let such an one take his ordinary dose of a solution of morphine and observe the result. The transformation to a non-professional observer is something miraculous. The gait is firm and assured; the muscular system is restrung; the face has grown in roundness and fullness, and is flushed as in youth; the eye is clear, sparkling and restless, and the conversation of our patient is cheerful and fascinating. But in a short time his rejuvenescence will fade away into the former spectral appearance.

Opium is resorted to among the higher classes of our own country to blunt care, to dry the tears of grief, to calm the tremors of the terror-stricken, and lull clamorous consciences to the coveted rest. In addition to this, the wear and tear of our hurried life, and the nervous prostration so common among fashionable women are temporarily relieved by this habit. The sensations of the opium habitué are alleged to be those of exquisite enjoyment, and the brilliant fancies that for a time obtain, transcend all real and healthy impressions received in the sober and waking state.

But what is the price that is paid for this dearly bought indulgence? An opium-eater is also an opium-sufferer. When he awakes to a consciousness of his real position, it is pitiable in the extreme to know that this state can only be mitigated by new and perhaps increased indulgence. There is probably no more terrible suffering than the complete exhaustion, the prostration of mind and body, which these patients suffer. The control over the muscles is lost, and epilepsy, paralysis and an unsteady

and ill-balanced gait are all frequent symptoms of this terrible disease.—Such patients have a full consciousness of their position, but are powerless to emancipate themselves from the opium habit. Their miseries and anguish are extreme; but in spite of all effort, they find themselves forced back again into the habit. It is just such cases that need medical aid and systematic treatment. There are no cases of any disease which more require to be lifted out from the depths of their suffering, and are in greater necessity of careful nursing, consideration and attention.

The opium habit will yield to proper treatment, and can be thoroughly eradicated if the patient will put himself under the necessary control, and desires a cure himself; but, even with the best of medical treatment, the *medecina temporis* alluded to by Cicero is an important element in the cure of the opium habit. By a slow reductionary course of treatment—the dose of opium being diminished gradually—thus avoiding much suffering and nervous prostration, and as a substitutional stimulant and sedative to the nervous system, the daily use of *electricity* in the writer's hands has proved, and is at the present time proving, in one of the most intractable cases, a sure and efficient means of stimulating the central nervous system and also invigorating it, so that the withdrawal of the opium is attended with very little suffering to the patient. Not only does the stimulating and tonic properties of electricity take the place to the nervous system of the opium, but it directly diminishes the appetite for it, in the same manner as it does of alcoholic inebriety, where our patients have repeatedly told us that they no longer felt the craving for the alcoholic stimulus.

The patient just referred to as a difficult case for treatment, has been in the habit of taking opium for *thirty-five years*, until *two* hundred grains were taken daily, together with two hundred and forty grains of chloral. This patient was admitted on the verge of insanity, with defective memory, staggering gait, defective articulation, complete loss of muscular power and maniacal excitement. He had delusions of fear and persecution, and was suspicious of all about him, and the whole condition of the nervous system was pitiable in the extreme. After the first day, the chloral was withdrawn, and nerve tonics, together with strong beef tea and milk, alternated at short intervals, were given. The stomach soon became quiet, and the systematic use of electricity was at once commenced. The induced Faradic current was applied to the central nervous system, applications being made to the brain, spinal cord and sympathetic nerve. To quiet the cerebral excitement, the constant or galvanic

current was applied for three or four minutes to the bi-temporal region with the most gratifying results—the patient becoming quiet, and a distinctly sedative action was at once obtained. A very weak current only is admissible to the bi-temporal region—four cells of a freshly-charged battery being amply sufficient to induce the desired quieting effects. The citrate of caffeine, in two-grain doses, has also a decidedly counteractive influence to the effects induced by opium, and is a valuable adjunct to treatment.

In the case referred to, our patient is gradually being deprived of his opium by fractional doses, and is enthusiastic regarding his cure, and co-operates to the fullest extent with our endeavors, so that we can safely predicate a cure in time.

The paralysis which occasionally appears in connection with opium habit of long standing, is probably the result of delicate molecular changes in the nerves and muscles, rendering them incapable of discharging their normal function.—*Virginia Medical Monthly.*

NOTES.

Georgia State Dental Society.

The tenth annual session of the Georgia State Dental Society was held in the city of Atlanta, commencing on the 29th of July, 1878, at 10 A. M., Dr. M. H. Thomas, President, in the Chair. The State Board of Dental Examiners met at the same time and place, and accomplished a very effective work for the good of the profession throughout the State.

After an unusually interesting session of three days, the Society elected the following officers for the ensuing year, and adjourned to the second Monday in July, 1879, at Augusta, Ga.:

President, Dr. W. C. Wardlaw, Augusta, Ga.; First Vice-President, M. S. Jobson, Perry, Ga.; Second Vice-President, J. A. Chapple, La Grange, Ga.; Corresponding Secretary, L. D. Carpenter, Atlanta, Ga.; Recording Secretary, R. A. Holliday, Atlanta, Ga.; Treasurer, H. A. Lawrence, Athens, Ga.; Committee of Arrangements, Drs. George Paterson, Waynesboro, Ga.; G. H. Winkler, Augusta, Ga.; Samuel Hope, Atlanta, Ga.

L. D. CARPENTER,
Cor. Sec.

The Local Action of Medical Substances Upon the Teeth.

After a series of experiments continued over a considerable space of time, M. Maurel has determined the following facts in regard to the action of various substances upon the structure of teeth. Arsenious acid has no influence whatever upon either the enamel, cement, or dentine. Citric acid attacks and renders soft and friable all the dental structure. Tannic acid is without action on the enamel, but colors a light-brown both the dentine and cement, and renders the former softer. Phenol is without effect on the enamel;

colors the cement brown, but its effect on dentine is not known. Vinaigre de Bully (a cosmetic) is without action on the dental structure. Common salt gives to dental structures a light-green tint; is without effect upon the hardness of cement, but, under certain circumstances, appears to soften the enamel. Its action on the dentine is not known. Chloride of zinc has no effect on the enamel; renders the cement transparent, but has little appreciable influence upon dentine. Chloride of antimony attacks the enamel in the most active manner, and the cement and dentine with nearly the same activity. Chloride of iron renders enamel brittle, softens the cement, and likewise, probably, dentine. Iodide of potassium is innocuous as regards enamel and cement, but probably softens dentine. The Liquor of Van Swieten, without softening the enamel, dulls its brilliancy, colors the cement a yellowish-orange without altering its consistency; its action on dentine is not known. Tincture of iodine causes enamel to disintegrate. The color which it imparts to the cement and the dentine are fugitive, and it is without effect on the consistence of the latter two structures.—*Bull. Gen. de Therap.*

Loss of Tongue with Restoration of Distinct Articulation.

Dr. I. D. McKew exhibited a patient who had lost his entire tongue by accident, but who could articulate perfectly any word. He read for the members out of a medical journal, and could be distinctly understood by every one present from any part of the room. When twelve years of age, he was run over on the street and terribly crushed. Both jaws were excessively fractured, and he lost much bone from the right side of the face. Besides these injuries, he had fractures of the clavicle, scapula and ribs, on the right side, with much blood extravasation over the right side of the chest. Ten days after the accident, the entire tongue sloughed off from near the hyoid attachment. For three weeks the child was nourished exclusively by enemata. For two years after the accident, the boy could not express himself recognizably in words. About that time he commenced to speak, and now, after ten years, he articulates so distinctly as to secure employment as a clerk. He finds no difficulty in eating.

Upon examining the mouth, the two sides of the lower as well as upper jaw have their rows of teeth approaching within a half inch of each other, and the great mobility of the floor of the mouth, thickened by this crowding, enables the food to be kept under the teeth in masticating. Only a small nodule of tongue is visible at the pharyngeal orifice.—*Virginia Medical Monthly.*

The Telephone in the Diagnosis of Stone in the Bladder, &c.

Mr. Editor:—Prof. Hunter McGuire [of this city] has a telphone in operation, running between his office and the "Retreat for the sick." A few days ago, he suggested to me to detach the hand piece of the Bell telephone from the instrument in his office, and attach it to a steel sound, and test it in a case of stone in the bladder.

The hand piece of the telephone contains a diaphram and permanent magnet. The slightest touch of the stone could be distinctly heard. When the sound came in contact with the calculus so lightly as not to be felt by the hand, the impression made upon the ear was plain and unmistakable and greatly intensified. This will be a valuable additional agent in the diagnosis of stone, and when we remember how many surgeons have been misled by the mere sense of touch, and how many patients have been cut and no stone found, we must foresee that it will be an agent employed by every surgeon in doubtful cases.

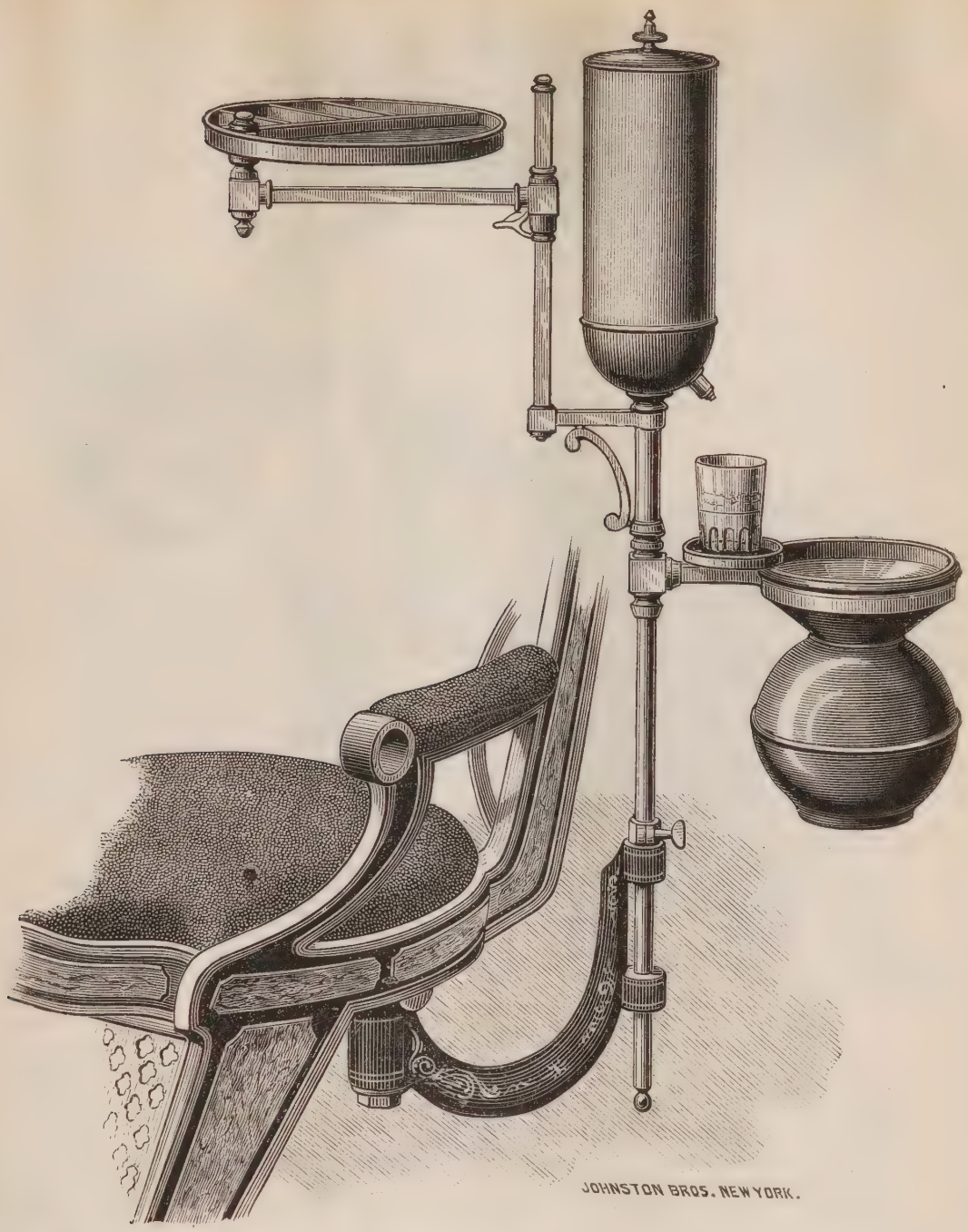
The same means could be employed in the diagnosis of foreign bodies in the throat, ear, nose, rectum, joints, limbs, and indeed anywhere in the body; and not many days will pass, before we will hear, through this instrument, new sounds in the chest, abdomen, uterus, &c., and our means of the diagnosis of diseases in these organs increased.

Very truly, &c., yours,
HUGH M. TAYLOR, M. D.

Richmond, Va., June 5th, 1878.

[Since the above note has been in print, we see in our secular papers, "June 22d," that Sir Henry Thompson has been making investigations in this same direction, but that Dr. Taylor's work was independent of Sir Henry Thompson can be seen from the date of his letter (*June 5th*).—*Ed. Virginia Medical Monthly.*

WILKERSON RESERVOIR SPITTOON—AND BRACKET.



This attachment to the Wilkinson Dental Chair is designed to satisfy a want long felt by those of the profession who are so situated that a supply of running water is not readily obtained.

By reference to the illustration accompanying this advertisement it will be seen that a Reservoir of water is supported above the Cuspador, upon a nickel plated column, which in turn is held firmly by a japanned arm which swings freely from the side of the chair. It is very strong, and imparts its own steadiness to the whole apparatus. The plated column is adjustable vertically, and can be secured at any height as compared with the chair that may suit the requirements of the operator. By simply lifting the rod that projects through the centre of the cap of the Reservoir a valve in the bottom of the Reservoir is opened and a gush of water is permitted to pass to the Cuspador, the funnel of which is so constructed that its whole surface is flushed and rinsed by the water. The capacity of the Reservoir is sufficient to rinse the Cuspador twenty times. The attachment of the Cuspador is such that it is readily removed when it is desirable to empty it. It is provided with a gold trap of the latest and most improved form. A glass and faucet for drawing water from the Reservoir is provided.

The bracket table is so constructed that it can be raised and lowered by one hand, and is so mounted on the post that it can be placed in any position the operator may desire. *The whole attachment is highly finished and handsomely nickel plated.*

Price..... $50 00

JOHNSTON BROS.,

1 **1260 Broadway, N. Y.**

COMBINATION WILKERSON CHAIR ATTACHMENTS.

STYLE 1.—As shown in cut, including nickel plated spittoon, with gold trap, and Allan bracket table, also with nickel plated tumbler holder.....$40 00

This table of walnut, handsomely ornamented with French walnut, is fourteen inches square and three inches deep. It has one drawer, fitted for about one gross of engine instruments; two drawers adapted for gold preparations, and two for filling instruments.

STYLE 2.—Same as above, with a porcelain cuspador instead of the nickel plated spittoon..... $32 00

STYLE 3.—Same as style 1, except with Morrison bracket table instead of Allan table..... $32 00

STYLE 4.—Same as style 1, except with Morrison table and porcelain cuspador, instead of Allan table and nickel plated spittoon. $24 00

STYLE 5.—Same as style 1, less spittoon and fork, and tumbler holder..... $25 00

STYLE 6.—Same as style 1, but with Morrison table instead of Allan table, and less spitton, fork, and tumbler holder. $17 00

STYLE 7.—Attachment and nickel plated spittoon and glass holder (no bracket) $25 00

STYLE 8.—Same as style 7, except with porcelain cuspador instead of nickel.. $17 00

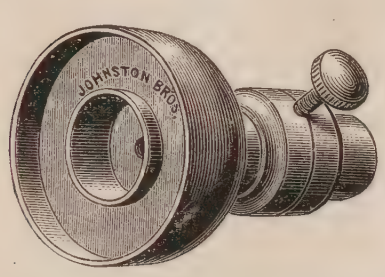
NOTE.—We can supply a few very fine rosewood bracket tables—Morrison style—fourteen inches square and one inch deep, at four dollars each above the price with Morrison walnut table, or four dollars less than where the Allan table is supplied.

For plain cheap spittoon see Chair advertisement.

SHANNON'S DISK MOUNTER.

THE INVENTION OF DR. W. T. SHANNON.

The SHANNON DISK MOUNTER enables one to do well with the greatest rapidity, what before has been done imperfectly and slowly by such dentists as have essayed the task at all. The directions are simple enough. To mount an "Arthur" or other disk so that it will be perfectly true on its mandrel: Take a screw mandrel or an old bur, warm the end which is to be bedded in the corundum over a spirit lamp, then pass it through the center of the disk; then, while still warm, pass the mandrel into the large end of the mounter, and press the disk on to it, having the face of the disk held firmly against the face of the mounter until it cools, and so is fastened—when it will be found to be true.



Price, - - - - - - - - $1 00

JOHNSTON BROS.

Patent applied for. 1260 BROADWAY, N. Y.

IRIDIUM PLATINA NERVE BROACHES.

They possess the following advantages:

They do not corode in the slightest degree, even when exposed to moisture, acids, iodine, or other medicines.

They can be cleansed perfectly from diseased matter, which gets on them when used to extract dead nerves, or from traces of medicines used in treating diseased teeth, by heating to redness in the flame of a spirit lamp.

Price, per package ($\frac{1}{2}$ dozen)..... $1 50

" ($\frac{1}{4}$ " 75

JOHNSTON BROS,

1260 Broadway, N. Y.

SPECIALTIES.

For full description of each of the specialties mentioned below see previous numbers of *Johnstons' Dental Miscellany*. (Specimen copies free on application.)

LIQUID NITROUS OXIDE.

PURE.

Can be kept in the cylinders for years—indefinitely—without deterioration.

Price of 100 gallon cylinder, $10—filled	$16 00
Refilling (express charges paid by us)	6 00
Price of 500 gallon cylinder $22, and 500 gallons of gas	44 50
Refilling (500 gallons gas), freight paid by us	22 50
Price of 1,000 gallon cylinder $36, and 1,000 gallons of gas	81 00
Refilling (1,000 gallons of gas), freight paid by us	45 00

APPARATUS FOR LIQUID NITROUS OXIDE.

1. THE SURGEON'S CASE.

No. 1 (5 gallon bag) price $42. No. 2 (7 gallon bag), price $44

2. THE NICKEL PLATED GASOMETER—very ornamental.

Price, with Inhaler and all necessary adjuncts for administering gas, $140 00
Either 100 or 1000 gallon cylinders can be used with each gasometer.

3. THE JAPANNED GASOMETER.

Plainer, but otherwise same as above $90 00

4. TRIPODS—for holding cylinders of Liquid Nitrous Oxide, when one desires to dispense with the morocco case of the Surgeon's Case, or with the gasometer.

Price of Tripod, for 100 gallon cylinder	$4 00
Same with filled cylinder, and all needed adjuncts	34 00
Price of Tripod for 1000 gallon cylinder	8 00
Same with 1,000 gallons of gas, and cylinder, and all needed adjuncts,	103 00

5. The Suspension Engine—with Cone Journaled Hand-Piece. The steadiest and most accurate dental engine made.

Price.....$50 00
With Lock-Bur Right Angle.....$55 00

6. The Remodelled Morrison Engine.

Price.....$30 00
With Cone Journaled Hand-Piece..... 35 00
With Lock-Bur Right Angle..... 40 00

7. Johnston's Adjustable Fountain Spittoon.

Can be adjusted to any height of the chair, and moved to and from the patient, giving the operator the opportunity to work on either side of his chair, without annoyance from the spittoon.

Price, handsomely plated.....$60 00

The Dentist's Appointment Book
and Pocket Record.

Printed in Carmine and bound in Morocco, with rubber fastenings and card pocket, $1.25

JOHNSTON BROS.

DENTAL PICTURES:

Pictures on Dental subjects are not very numerous, and will always possess interest to practitioners of dentistry. Having reproduced several copies of ancient paintings and engravings, illustrative of dentistry in other countries and in olden time, as frontispieces for the Dental Miscellany, we have, at the request of friends, also printed them upon plate paper, in suitable form for framing or for preservation in a portfolio.

Those now ready are—

1. Der Zahnarzt—From a Steel Engraving of 1672.
2. The Tooth Drawer—English.
3. The Monkey as a Dentist—From a painting by DeCamps, 1840.
4. Der Zahnbrecker—From a German Plate.
5. Transplantation—1787. By Rowlandson.
6. The Ludicrous Operator. By J. Harris, London, 1768.
7. Primitive Dentistry. Scene in Persia by an eye witness.
8. Fifth Pair of Nerves—not colored. From Tomes' Dental Anatomy.

Price each, by mail, 50 cents.

JOHNSTON BROS.,
Broadway, cor. 32d St., N. Y.

FLOSS SILK.

A superior article, per dozen, $1 50.

JOHNSTON BROS.,
1260 Broadway.

University of Pennsylvania.

DENTAL DEPARTMENT.

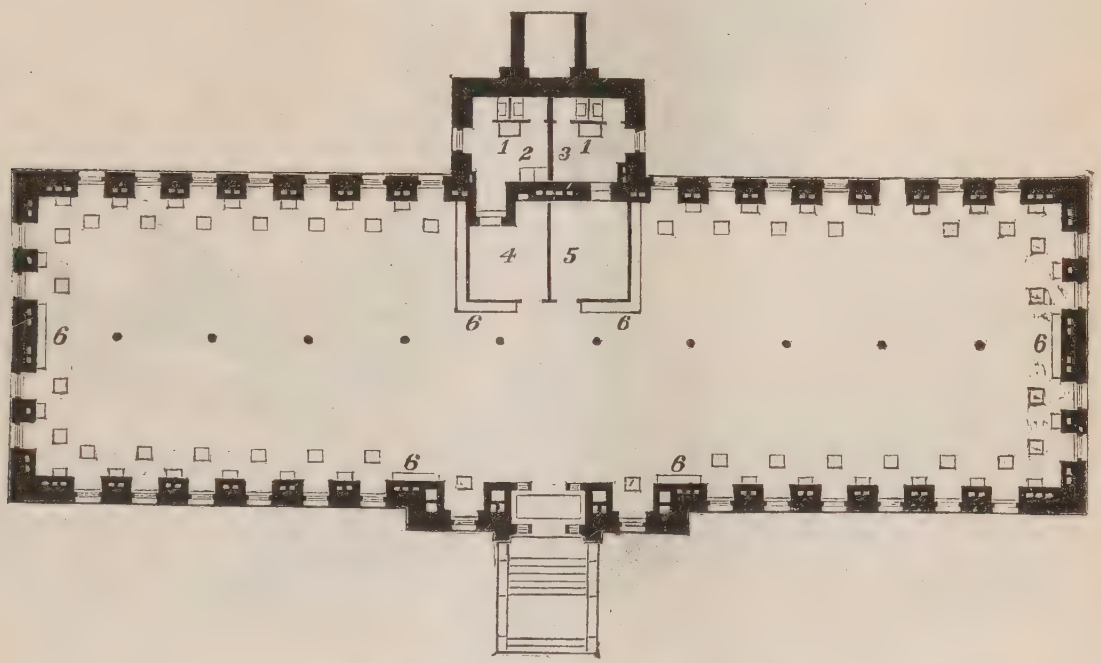
VIEW OF THE NEW BUILDING ERECTED FOR THE ACCOMMODATION OF THE OPERATIVE CLINICS.

This edifice, now nearly completed, is built of green stone and granite. The main entrance seen in the cut, connects only with the dental operating room ; acces to the laboratories in the upper stories being on the opposite side nearest the main hall, thus securing privacy and freedom from noise.

The operating room is 140 feet in length by 40 feet in width, and as the building does not adjoin, though within 60 feet of the main medical hall, it is lighted by windows on all sides, thus affording 360 feet of window frontage. The room is furnished with private closets for the safety of the books, instruments and clothing of the students ; it is also supplied with stationary washstands, and every other convenience; it occupies the first story, and everything has been done to make it perfect in its adaptation to the practical work of operative dentistry. The arrangement of the windows, so as to command the best light, has received careful consideration, and we may safely say that it is unequaled anywhere. A liberal appropriation has been made

by the Trustees for the equipment of the operating room. In front of each window is placed a Morrison Chair of the latest and most approved pattern, also a handsome nickel-plated movable bracket, and a neat walnut table for the accommodation of instruments, etc.

The second floor will be devoted to practical laboratory work in chemistry; its dimensions are the same as the *Dental Clinic Room*, and will be used in common by the students of both the Dental and Medical Departments. Its equipment will consist of suitable tables and chemical apparatus for the accommodation of two hundred students, a large sum having been appropriated for this purpose.



PLAN OF DENTAL OPERATING ROOM.

The squares in front of each of the windows represent operating chairs. The smaller squares between the windows represent walnut stands for instruments, etc.

Fig. 1. Stationary washstands.

Fig. 2. Private Room for males.

Fig. 3. Private Room for Females.

Fig. 4. Waiting-room for males.

Fig. 5. Waiting-room for females.

Fig. 6. Closets for the safety of the books, instruments, and clothing of the students.

The operating room and the chemical laboratory will be ready for occupancy by the 1st of October.

The lecture rooms and laboratory of mechanical department are in the main medical hall.

C. J. ESSIG, Secretary,
1533 Locust Street, Philadelphia.

Wilkerson Dental Chair.

PATENTED NOV. 20, 1877.

PRICE, $175.

Spittoon Attachment with porcelain Cuspador	$6 00
" " metallic Cuspador and gold trap	14 00

The cut is a good representation of this unique chair. The acknowledged requirements of a first-class dental chair have been here secured by Dr. M. B. Wilkerson—the inventor—by methods showing great originality. All cranks are dispensed with and levers substituted for them. The chair is raised by pressure of the foot on the long lever, which hides the back foot in the cut. This operation requires very little effort, and occupies but eight seconds, and is only equivalent to stepping up eight steps. To lower the chair one has only, with the toe of his boot, to raise the lever just back of that first named, and the chair sinks rapidly and noiselessly until the lever is dropped, when it instantly stops. Except when in use the long lever folds in under the chair.

A touch of the lever in front of that just named, leaves the chair free to rotate through the whole circle. Directly beneath the seat of the chair, and close to the seat, is shown a lever, which, when pressed forward, permits the rocking movement while the lever is held, but whenever released fastens the chair in position.

Thus the three principal movements, elevation, rocking and rotation, are accomplished. The minor movements, all of great importance, however, are the raising or lowering of the back of the chair; the raising in like manner of the head-rest; the slight rocking of the seat of the chair, so as to prevent the patient from sliding forward; the adjustment of the footstool at various lengths and heights; the spring back support to rest the small of the back. This, at will, is converted into a capital child's seat.

An arm-rest is shown at the right of the head-rest. It can be secured on either side of the head-rest at will.

The whole chair is of the most substantial construction and highly ornamental. It will be upholstered in either green or garnet plush or in leather.

This is *not* an hydraulic chair. It has *no pump*, but is raised simply and solely by a lever actuated by the foot. When raised, the elevation of the central column, which supports the chair, tends to produce a vacuum in the chamber through which it passes, and this chamber is immediately filled by a column of oil, which, opening a valve at the bottom of the chamber and directly following up the central column of the chair, blocks it up whenever the lever ceases to raise it higher. Of course, whenever the same valve is tripped, the oil flows back into its receptacle, and the chair is rapidly and noiselessly lowered. *Not one drop of oil* has ever or can ever find egress from the inner base of the chair to its exterior. So much to silence constant misrepresentations of another dealer.

ADVANTAGES.

1st. It can be raised with the foot of the operator, and by a very slight effort.

2d. It can be raised in half the time of any other dental chair, except the Morrison.

3d. It can be lowered without exertion of force, and as much or as little, or as fast or as slow, as desired, by merely opening a valve.

4th. Its range of movement is superior.

5th. It has a perfect forward and backward movement, so that the patient can be rapidly inclined at any angle by a very slight exertion of force by the hand.

6th. Its arrangement for children is unique and excellent.

7th. Its footstool is readily adapted to the wants of large or small persons.

8th. Its head-rest is completely firm in any position in which it may be placed, has a large range, and is fastened by a single movement of the hand.

9th. The operator can control all its movements without once taking his hand from the mouth of the patient.

10th. It has a perfect rotary movement.

11th. By means of an adjustable foot it will stand firmly on any floor, however uneven.

We have orders for a large number, and are receiving more daily, and entering them in rotation.

JOHNSTON BROS., 1260 Broadway, N. Y.

JOHNSTON BROTHERS & SELBY, 23 N. Charles Street, Baltimore, Md.

The Morrison Dental Chair.

Comfort for both Operator and Patient, Rapid Movement, Simplicity of Construction, Great Durability.

The desirable features of a dental chair are almost completely enumerated above. The Morrison Chair answers each of these requirements more completely than any other chair made.

It contributes to the ease of the operator:

1st. By the lightness and rapidity with which the patient is raised or lowered to a convenient position.

2nd. By the form of its back, which is so narrow as to render it unnecessary for the operator to stretch to reach his patient.

3d. By permitting him to drop either arm of the chair entirely out of his way.

4th. By making it possible to operate in either a standing or sitting posture with equal facility.

It affords comfort to the patient:

1st. In the arrangement by which the lower back-pad may be moved forward to support the small of the patient's back.

2nd. The upper back-pad is readily raised or lowered, so as to exactly adapt itself to the wishes of any patient as if the chair had been made for this one person.

3d. By the readiness with which the patient may change the foot-stool from one position to another as suits their notion at the moment, and without disturbing the operator.

If desired this chair can be furnished with either the usual upholstery of dental chairs, or with Turkish upholstery—soft and with springs; or with summer seats and back—of cane; or with separate sets of all of these, which can be changed from season to season by the owner without difficulty or the necessity of employing mechanics of any kind.

Its movements are very rapid.

It can be raised from its lowest position, in which the seat is 15 inches from the floor, to its highest, 42 inches above the floor, in seven seconds. Both low

and high based chairs are here combined in one; giving a vertical range of more than two feet.

It has no equal in operations upon Children.

The child can be raised as high as needed by the tallest operator.

It is provided with a comfortable back and head-rest, exactly as is a grown person.

The foot-stool is quickly adapted to children of any size.

It is extremely simple.

The principal movements of the chair and head-rest are all under control of but three clamps, and the chair is adjusted in height by a single crank.

By one of the above-mentioned clamps it is securely fastened at any desired inclination, and all done in an instant.

It is very durable, because

1. Being made almost entirely of metal, open joints or season cracks are impossible.

2. The upholstery of this chair is so arranged that it can be renewed, by exchange of the upholstered parts, without leaving the rooms of the operator and at moderate expense.

ACCESSORIES.

CASTORS.—To secure the *rotary movement* for such persons as desire it, legs have been cast, having recesses in the feet, into which Castors are inserted. The castors in the front legs roll laterally only, so that by them the patient's face may be turned to the light. When in the right position a locking device permits you to fasten the castors so that they cannot be moved until unlocked. The castors in the back feet are so placed as to revolve only back and forward, so that while they permit you to easily roll the chair like a wheelbarrow out of position if you wish to sweep, they cannot be moved by the force exerted in plugging a tooth.

NARROW BACK PAD.—To be used sometimes instead of the top pad, and sometimes as a third pad when the back of the chair is stretched to full length.

SPITTOON ATTACHMENT—see in the cut—is a cheap and convenient substitute for a separate spittoon. Is more convenient and costs less.

HEAD-REST.—The Morrison Head-Rest is a *thoroughly* good one, and has given general satisfaction. It is supplied with the chair if we are not otherwise directed, and the price of the chair as named includes this rest. The Johnston Head-Rest is *our latest*, and is everywhere approved. It can be had with the chair at an extra cost of $8.00. It is shown in the cuts.

EXTRA UPHOLSTERY.

Turkish Upholstery.

Some persons having desired a softer style of upholstery than is usual in dental chairs, we have adopted, after many experiments, a modification of what is usually known as the Turkish chair. The seat is made about four inches higher in front than at the back, and both it and the lower back are made very soft by the liberal use of steel springs and hair, the edges being kept full by a piece of heavy spring wire which is built into the upholstery.

The perpendicular edges are covered with a puffing to match, and "set off" with handsome silk cord.

The arms and upper back pads are made heavier than usual, and are puffed and corded to match the seat.

Real Morocco.

We also have produced a very elegant article by the use of real morocco, handsomely embossed. It is durable and particularly desirable for warm climates.

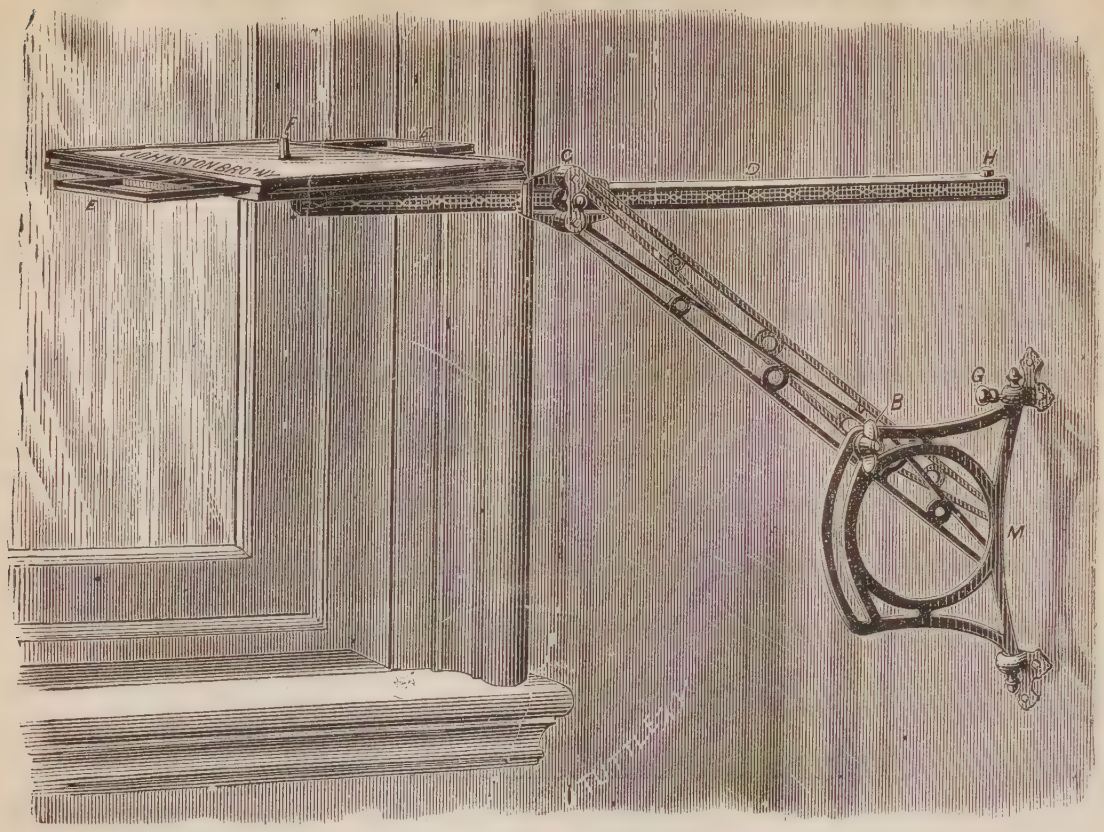
PRICES.

In fine green or garnet plush—with Morrison Head-rest	$ 150.00
Boxing	5.00
To which price add, if ordered:	
With Castors	10.00
With Johnston Head-rest, instead of Morrison	8.00
With extra back-pad	4.50
With spittoon attachment and porcelain cuspador	8.00
With nickled metallic cuspador and gold trap	10.00
With nickled metallic cuspador and gold trap, and nickled spittoon attachment	18.00
With Turkish upholstery	15.00
Real morocco embossed	10.00

JOHNSTON BROTHERS,

11 **Broadway, cor. 32d St., N. Y.**

MORRISON DENTAL BRACKET.



PRICES.

With Black Walnut Table, 12 inches square.....$25.00.
With Rosewood Table, 14 inches square, and Velvet Top, and Drawers about five-eighth inch deep, lined with Leather..... 40.00.
The Rosewood Table alone, as above, to fit any Morrison Bracket..... 17.00.
Boxing..... .....$1.00.

The cut represents the table in its highest position, and distant from the wall a little more than half the distance it is capable of taking. By loosening the thumb-screw B, and allowing it to rest in the bottom of the slot, (instead of at the top as represented here,) the table will occupy a position as much below M as it now does above the same point. The extreme range, that is, the distance between the table when at its highest and its lowest position, is 24 inches.

M represents a metal frame which is secured to the wall or other support by screws. It swings from side to side as a gate on its hinges. C. M. represent light but strong metallic arms, hinged at M as a centre and moving up or down. At B is a thumb-screw passing through a slot in the frame M. By it the arms can be firmly clamped at any desired height.

At C is a slide-rest through which the hollow rod D passes freely, and may be clamped at any distance from its ends. At one end of this bar a square table is supported, having in it foil and instrument drawers. This table is capable of rotation round F, which is the burner of an alcohol lamp, the alcohol being contained in D and introduced at its further extremity H. Among the advantages of this bracket are these:

1st. It combines a greater variety of range and movement than any other.
2d. It is rigid in whatever position it is clamped, and will hold 15 lbs. with steadiness.
3d. It provides a clean receptacle for foil and instruments.
4th. It is obvious that a square table is very much more convenient as an instrument stand than a round one.
5th. Its drawers extend through the table and can be opened from either side.
6th. To those having a Morrison Chair it is almost indispensable, as it will follow the chair to either its lowest or its highest position.

It is handsomely ornamented and nickel-plated throughout, so that it is a very beautiful addition to the furniture of the operating room.

JOHNSTON BROTHERS,
Broadway, cor. 32d St., N. Y.

PRACTICE FOR SALE.

A practice of upwards of $200 per month, in a New England town, can be had by any good Dentist, who is also a gentleman, on payment for office furniture. Value $300. Health of one of my family makes it necessary to move to the West.

Address "P. D.," care of JOHNSTON BROS.,
Cor 32d Street & Broadway, N. Y.

A DENTIST

In every way capable, and able to command Five Hundred Dollars cash, can secure a good practice in a village of New York. Income $2,500 per year.

Address "M. K.," care of JOHNSTON BROS.,
Cor. 32d Street & Broadway, N. Y.

FRENCH CROWN AMALGAM.

The Manufacturer says of it: The Amalgam is composed of materials which the dental profession at large recognize as the best (except gold) for filling teeth. It is of finest quality. It has the merit of becoming hard in fifteen minutes after being prepared for use, and does not change color or shrink.

PRICES.

1 oz. box, with mercury	$3 00
⅔ oz. " " "	2 00
⅓ oz. in envelopes	1 00

For sale at wholesale and retail.

JOHNSTON BROS., 1260 Broadway, N. Y.

JOHNSTON BROTHERS' LAVA STRIPS.

PATENT APPLIED FOR.

For finishing fillings, a new and unequaled polishing material.

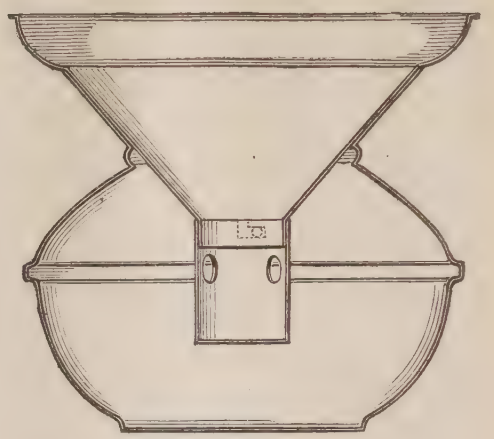
Thinner, more convenient and more efficient than corundum tape.

Price, per Box. ..... 50 cts.

JOHNSTON BROS., 1260 Broadway, N. Y.

NICKEL PLATED CUSPADOR WITH GOLD-TRAP.

CUSPADOR.



Section of the cuspador, showing the Funnel with gold-trap attached.

The cuts represent a metallic cuspador, handsomely nickel plated throughout, designed to fit the spittoon attachment of the Morrison Chair. As the funnel can be removed by simply lifting it from the Cuspador, all parts are as readily cleaned as is the porcelain Cuspador now in use. The gold-trap—which is an attachment of the funnel—will, in a short time, effect a saving sufficient to pay for the Cuspador.

PRICES.

Spittoon Bracket, plain.....not pictured.....	6 00
" " Nickel Plated— " "	8 00
Nickel plated Cuspador and Funnel with Gold-Trap..	$10 00
Funnel and Gold-Trap.....	3 50

JOHNSTON BROS.,
Broadway, cor. 32d St., N. Y

TOOTH BRUSHES.

A first-rate article.

4 Row Brushes, per dozen.....	$3 00
5 " " "	3 80
Children's Brushes "	2 30

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.

WILKERSON DENTAL REGISTER,

FOR SALE, WHOLESALE AND RETAIL BY

JOHNSTON BROS. & SELBY,

23 North Charles St., Baltimore, Md.,

AND BY

JONHSTON BROS.,

1260 Broadway, N. Y.

We quote Editorial Notice from "*American Dental Journal*":

"*Dental Register and Examination Book.*—By B M. Wilkerson, D.D.S., M.D., Demonstrator of Operative Dentistry in the Baltimore College of Dental Surgery. Baltimore, 1876.

"As a Dental Register this new work presents as complete, convenient, and concise a system as it is possible to prepare; and dental practitioners will find it as simple as it is useful.

"The plan, according to which it is arranged, requires the least practicable amount of time or labor in registering dental operations and delineating the condition of the oral cavity, thus meeting the requirements of the operator in such a manner as to give the greatest satisfaction.

"The diagrams, four in number on every page, are the special design of the author, and the most perfect for delineation which have yet been presented in a work of this kind. A book of this form containing 400 pages will register 1,600 patients, whereas the ordinary Case Book requires one entire page for each patient.

"This new Register is also arranged for conveniently representing the character of professional services for each member of a family, without regard to numbers, with as much facility as the appointments are entered in a 'pocket companion.' Blanks for name, residence, &c., opposite each cut, prevent the possibility of confounding patients. This new work is gotten up in a handsome form with index, and printed on excellent paper."

Will Register 1,600 Patients. Price, $4.50.

TRADE SUPPLIED AT LIBERAL DISCOUNT.

Second-Hand Chairs

At 1260 Broadway, N. Y.

No. 1.—AN OLD PORTER CHAIR, covered with striped reps, worn a little; has no movements, except Head Rest, raises and lowers. Suitable for an extracting chair. Price $15.

No. 2.—A No. 3 ARCHER CHAIR, covered with green plush (plush and gimp faded and worn a little) with No. 3 Archer Foot Stool, covered with red carpet, and a No. 1 Archer Extension Bracket and Table with Drawers. Price $60.

No. 3.—A No. 3 ARCHER CHAIR, covered with green plush. This is a new chair, and has not been used, is shopworn a little, with a No. 3 Archer's Foot Stool, new, covered with green carpet. Price $93.00.

No. 4.—A No. 4 WHITCOMB CHAIR, *rosewood*, illustrated on page 120 White's Catalogue, 1867, covered with *green plush*, foot-stool attached to chair. This Chair has two head-rests, one of Whit-

comb's pattern, and one of S. S. White's pattern, with large pad. The right arm has been removed for convenience, and a metal one substituted lower down. Is a good chair in every respect. Price, new, $230; will sell for $90.

No. 5.—A No. 2 ARCHER CHAIR, covered with green plush. Plush is faded, in fair order, with a No. 1 Foot Stool, covered with green carpet. Chair has old style rachet head- rest, with a Butler's Spittoon attached to chair. Price $55.

No. 6—A ROSEWOOD WHITCOMB CHAIR, covered with green plush; has a large pad on head-rest, in good order—foot-stool attached to chair. This is a rosewood chair, and is first-class in every respect. Price $75.

No. 7.—A No. 6 ARCHER CABINET CASE, used very little and as good as a new one. Cost price $90; will sell for 60.

No. 8.—A No. 6 ARCHER CABINET CASE, used very little, and as good as a new one. Cost price $90; will sell for $60.

No. 9.—A CASE OF SIX DRAWERS, on castors, a lock in every drawer, in good order, marble top. Price $20.

No. 10.—A LATHE, same style as old U. S. Lathe, in good running order, painted green; has no band, and no spindles for holding wheels and brushes. Price $10.

No. 11.—A CABINET CASE, desk pattern, mounted on a stand, has castors, five drawers, and top opens on hinges, made very strong. Price $10.

No. 12.—A ROUND SPITTOON, wood, with marble top, funnel is broken. Price $5.

No. 13.—A WHITCOMB SPITTOON, or running water, illustrated page 126, White's Catalogue, 1867, without instrument support. Price $15.

No. 14.—An S. S. WHITE CHAIR, in good order. Price $125

No. 15.—A MORRISON CHAIR, green plush, in fair order and, otherwise first-rate. Price $100.

No. 16.—A WHITCOMB CHAIR, solid rosewood, movements perfect, garnet plush, faded but good, with foot-stool attached and extra foot bar, and with instrument table attached. Price for all $70.

Boxing on all the above will be charged at cost.

SECOND-HAND CHAIRS,

FOR SALE BY

JOHNSTON BROTHERS & SELBY,

No. 23 North Charles Street, Baltimore, Md.

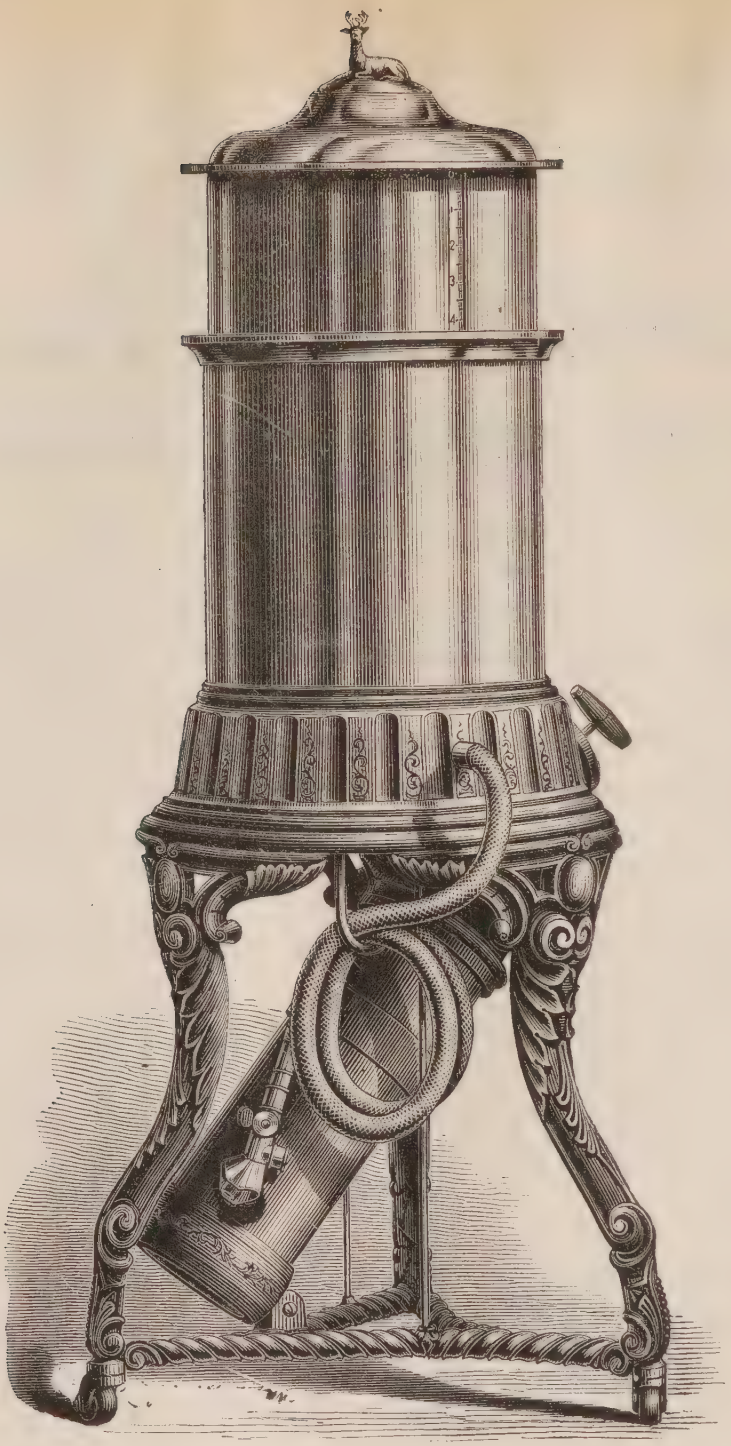
No. 17.—ONE ARCHER CHAIR, newly re-covered with garnet plush; mahogany frame, with the best Snowden & Cowman head rest; with Archer's best detached foot stool, with crane bracket, and Archer's octagon marble top spittoon. All in perfect order, and practically as good as new. Cost about $200. Will be sold complete for $100. boxed. This is a great bargain. Never used since it was covered.

No. 18.—ONE HARRIS LOW BASE STEEL SCREW CHAIR, with *low right arm*, double back. S. S. White's best head rest, covered with green plush, with nickel plated spittoon and gold trap. All in perfect order, working as good as new, and only a little worn. This chair was made to order and is the best of its class. A great bargain. Price $110, boxed. Chair and spittoon cost $217.

No. 19.—ONE ARCHER CHAIR, covered with crimson rep, has backward and forward movement. Seat raises. Adjustable head rest. No foot stool. Has octagon marble top spittoon. This chair has just been re-covered. Chair and spittoon would be sold for $40; boxed $45.

No. 20.—ONE ARCHER CHAIR, with detached foot stool, covered with green plush; has all movements and in good order. One octagon marble top Spittoon. All in good order and looks well. Would sell for $75. A great bargain.

No. 21.—ONE LEATHER COVERED HARRIS CHAIR, with steel screw. All in complete order and looks well. Would almost be thought new. Cost $185. Price $100, boxed.



NICKEL-PLATED GASOMETER

AND ORNAMENTED STAND

FOR LIQUID NITROUS OXIDE.

NICKEL-PLATED GASOMETER.

This style of apparatus is especially designed for those who use large quantities of Nitrous Oxide, or who may desire a highly ornamental piece of office furniture, coupled with a *really economical* gas apparatus, the gas being furnished in 1,000 gallon cylinders, at a reduction of 25 per cent. in price.

The cut on the opposite page represents the nickel-plated gasometer, mounted on a stand, with a 1,000 gallon cylinder, in position, under the gasometer.

Heretofore, gasometers have been so unsightly, that it has been considered desirable to place them in an adjoining room or behind a screen; we take pleasure now in offering to the profession a gasometer so handsomely gotten up, that it will be an ornament to any office, and at the same time so constructed, as to be vastly superior to any apparatus heretofore used. The gasometer will, when full, hold 10 gallons of gas —this is sufficient to completely anæsthetize any patient. The usual amount of gas given to a patient is from 3 to 5 gallons.

If it is desirable to keep the patient under the influence of the anæsthetic for any length of time, (as in a surgical operation), the operator has under his control 1,000 gallons of gas, by merely turning the key seen in the cut at the right. The gasometer is nickel-plated, highly polished, and mounted on a carved iron stand, which is japanned and ornamented with bronze.

On the bell of the gasometer there is a scale graduated in gallons, and fractions of a gallon, so that the operator can readily see how much gas he has administered.

Another valuable feature in this gasometer, is a peculiar water-check or valve, so arranged that though the gas will flow freely on the lightest inspiration at the inhaler, it is instantly and automatically shut off by the water when the patient stops breathing.

This does away with the necessity of closing any stop-cock, and prevents all waste of gas; it also saves the dentist's time at the most critical moment, as he has only, after having administered the gas, to lay aside the inhaler and proceed at once to operate without the necessity of shutting any stop-cock. The stand is so constructed that a small (100 gallon) cylinder can be used while the large cylinder is being re-filled.

We should also call attention to the fact, that there is no liability to loss of gas from leakage, caused by the operator's leaving the valve of the cylinder open, for if there is such escape from the cylinder, the bell of the gasometer will rise, and the operator will have his attention called to the waste, thus enabling him to correct the difficulty at once.

The whole apparatus is mounted on castors, and can be readily moved.

This apparatus is especially desirable where large quantities of nitrous oxide are used, or where it must be sent a great distance. In this form it is best to ship it by *fast freight*—which makes the cost of transportation very light. The gas can be kept for any length of time, and is constantly on hand *and always of the best quality.*

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.

Ohio College of Dental Surgery,

COLLEGE STREET, CINCINNATI.

THE THIRTY-THIRD ANNUAL SESSION—1878-9.

Faculty.

JAMES TAYLOR, M. D., D. D. S.
Principles and Practice, and Dental Hygiene.

WM. CLENDENNIN, M. D.
Anatomy.

J. S. CASSIDY, M. D. D. D. S.
Chemistry and Materia Medica.

J. L. CILLEY, M. D.
Physiology and Histology.

A. O. RAWLS, D. D. S.
Pathology and Therapeutics.

H. A. SMITH, D. D. S,
Clinical Dentistry.

J. R. CLAYTON, D. D. S.
Mechanical Dentistry and Microscopy.

Special Professors:

F. H. REHWINKEL, M. D., D. D. S.
Oral Surgery.

G. W. KEELY, D. D. S.
Cause and Management of Irregularities of the Teeth.

C. I. KEELY, D. D. S.
Demonstrator of Operative Dentistry.

S. WARDELL, D. D. S.
Demonstrator of Carving Teeth.

FRANK BELL, D D S
Demonstrator of Continuous Gum Work.

ALEX BROWN. D. D. S.
Assistant to Chair of Chemistry.

E. G. BETTY, D. D. S., Demonstrator of Anatomy.

Clinical Instructors:

DR. S. B. BROWN,
DR. F. A. HUNTER,
DR. A. W. SMITH,
DR. D. W. CLANCEY,
DR. J. E. CRAVENS,
DR. J. K. JAMISON,
DR. J. I. TAYLOR,
DR. F. PEABODY,
DR C. R. TAFT,
DR A. F. EMMINGER,
DR. W. S. HOW.

This institution being strictly a *Dental College*, the lectures in all the branches taught, Anatomy, Physiology, Pathology, Therapeutics, and Materia Medica included, are arranged with the view to qualify the student to intelligently and successfully practice his profession.

The College Building was designed, erected, and is exclusively used for a Dental School. The lecture and clinical rooms are therefore well adapted for the uses to which they are put.

Terms of Graduation:

A candidate for graduation must be twenty-one years of age. He must have attended two courses of lectures in a Dental or Medical College, the last of which must be in this institution. A reputable dentist in actual practice five years, inclusive of the term of pupilage, may be examined for the degree of D. D. S., after attending one full course of lectures.

Fees:

Matriculation Fee (but once)	$5 00
Professor's Tickets for one session	75 00
Demonstrator's Ticket (for Anatomy)	5 00
Diploma Fee	20 00

It is desirable that the students should matriculate and be in attendance promptly at the beginning of the term. The term begins the 1st of November, and continues sixteen weeks.

Students coming to the city should call on the Dean. Good board can be had for $3.00 to $5.00 per week. For further information, address

H. A. SMITH, DEAN,
286 RACE STREET, CINCINNATI.

New York College of Dentistry.

1878-79.

FACULTY.

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FRANK ABBOTT, M. D., Professor of Operative Dentistry and Dental Therapeutics.

ALEX. W. STEIN, M. D., Professor of Visceral Anatomy, Physiology and Histology.

F. LEROY SATTERLEE, M. D., Ph. D., Professor of Chemistry, Materia Medica and Therapeutics.

J. BOND LITTIG, D. D. S., Professor of Mechanical Dentistry and Dental Metallurgy.

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JOHN ALLEN, D. D. S., Clinical Professor of Mechanical Dentistry.

JOHN T. METCALF, Clinical Professor of Operative Dentistry.

WM. T. LAROCHE, D. D. S., Clinical Professor of Operative Dentistry.

BERTRAND J. PERRY, D. D. S., Clinical Professor of Operative Dentistry.

FRANK M. ODELL, D. D. S., M. D., Clinical Professor of Operative Dentistry.

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D. W. WILLIAMSON, D. D. S., Lecturer on Operative Dentistry.

A. RUST CUYLER, D. D. S., Lecturer on Mechanical Dentistry.

C. F. W. BODECKER, D. D. S., Lecturer on Dental Histology.

EBEN M. FLAGG, D D. S., Lecturer on Mechanical Dentistry.

JOHN SEYMOUR CLARK, M.D., Lecturer on Chemistry, Materia Medica and Therapeutics.

Demonstrators.	*Assistant Demonstrators.*
D. W. WILLIAMSON, D.D.S.	JOHN C. MILLER, D.D.S.
A. RUST CUYLER, D.D.S.	GEORGE J. HARTUNG, D.D.S.
S. FRANK JOHNSON, D.D.S.	JULIUS M. STEBBINS, D.D.S.
GEORDE M. EDDY, D.D.S.	

Students may matriculate at any time, as the Infirmary is open for regular students of the College to practice in the entire year.

The regular course of Lectures will commence on Tuesday, October 1st, and continue until the latter part of February. Three hours of each day of the week (except Saturday) will be devoted to Lectures, and four hours to *Clinics*, and practice at the Chair and in the Laboratory, under the direction of the Demonstrators.

The Infirmary is furnished with twenty-four good chairs and all the appliances. The Lecture-room will seat, and the Laboratory accommodate, two hundred students ; all on one floor, and up one flight of stairs only. There is seldom any lack of patients for students to operate upon.

Tickets for one year's Instruction, including Course of Lectures, Matriculation, Demonstrators', Diploma Fees, and practice in the Infirmary the seven and one-half months between the sessions	$150.00
For the Course of Lectures only	100.00
Matriculation	5.00
Graduation Fees	30.00

Board may be obtained for from $6 to $8 per week.

For further information, address

FRANK ABBOTT, M. D., Dean.

22 West Fortieth Street, New York.

Philadelphia Dental College,

Nos. 108 & 110 N. Tenth St., above Arch.

SIXTEENTH ANNUAL SESSION, '78-'79.

Faculty.

HENRY MORTON, A. M., Ph. D., Emeritus Professor of Chemistry.
C. A. KINGSBURY, M.D., D.D.S., Emeritus Professor of Dental Histology and Operative Surgery.
J. H. McQUILLEN, M.D., D.D.S., Professor of Physiology and Dental Histology.
D. D. SMITH, M.D., D.D.S., Professor of Mechanical Dentistry and Metallurgy
S. B. HOWELL, M.D., Professor of Chemistry and Materia Medica.
T. C. STELLWAGEN, M.D., D.D.S., Professor of Operative Dentistry and Dental Pathology.
JAS. E. GARRETSON, M.D., D.D.S., Professor of Anatomy and Surgery.
HENRY I. DORR, D.D.S. Adjunct Professor of Practical Dentistry.

F. M. DIXON, Lecturer on Operative Dentistry.
EDWARD L. HEWIT, D.D.S., Demonstrator of Operative Dentistry.
ALONZO BOICE, D.D.S., Demonstrator of Mechanical Dentistry.
ARTHUR R. GAGE, D.D.S., Assistant Demonstrator.
FRANK EYRE, M.D., Ph.D., D.D.S., Demonstrator of Chemistry and Materia Medica.
M. H. CRYER, M.D., D.D.S., Demonstrator of Anatomy.
L. ASHLEY FAUGHT, D.D.S., Demonstrator of Physiology and Dental Histology.

Clinical Instructors.

J. FOSTER FLAGG, D.D.S.
C. A. KINGSBURY, M.D., D.D.S.
WILLIAM C. HEAD, D.D.S.
JAMES McMANUS, D.D.S.
H. C. REGISTER, M.D., D.D.S.
M. H. CRYER, M.D., D.D.S,
C. E. FRANCIS, D.D.S.

WARREN R. MILLARD, D.D.S.
J. L. EISENBREY, D.D.S.
JAMES MARTIN, D.D.S.
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The Spring Course of Lectures will commence on the first Monday of April, and continue until the last of June, Fall Preliminary Lectures, commencing Monday, September 2d, will continue daily until October. The Regular Winter Course commences Tuesday, October 1st, and closes on the last day of February ensuing.

Fees.—Tickets for the Course, including the Demonstrators, $100 ; Matriculation (paid but once), $5 ; Diploma, $30 ; Board $4 to $6 per week. For further particulars, address

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The defects of the Fountain Spittoons hitherto made are, that it is almost impossible to keep them from leaking, and that they occupy a rigid position close to the left of the chair, and hence prevent the operator from working on that side.

These defects will not be found in this spittoon, which is commended to the favor of Dentists by the following points of merit:

1st. It is readily adjustable to the position of the chair; that is, it can by an easy movement of the hand be raised or lowered to suit the height at which the chair is placed at the moment.

2d. The normal position of its base is, say, eighteen inches to the left side of the chair, from which position its basin will ordinarily be inclined towards the chair and patient; but should the operator desire to stand on that side of his patient, the standard of the spittoon can be instantly inclined in the opposite direction, so as to be entirely out of the way

3d. Instead of a wooden case, twelve inches square, is an ornamented metal tube one and a half inches in diameter, which will not warp, occupies very little room.

4th. Movable joints are so arranged that any leakage is impossible, since the waste from the bowl never comes to the joint itself, but is discharged below, in the bottom of the lower half of the socket of the globe, and conveyed into the waste pipes.

5th. It is provided with a gold trap, and an operator of good practice now using the ordinary spittoon will be able to save enough gold in from one to two years to entirely reimburse himself for this purchase.

6th. All its bright parts are of gun metal, and its tubing silk covered.

The water jet used is the device of Dr. Redman, of Louisville, Ky.

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Boxing..... 2.00

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We were never more sure of doing signal service to the Dental Profession than now in offering the

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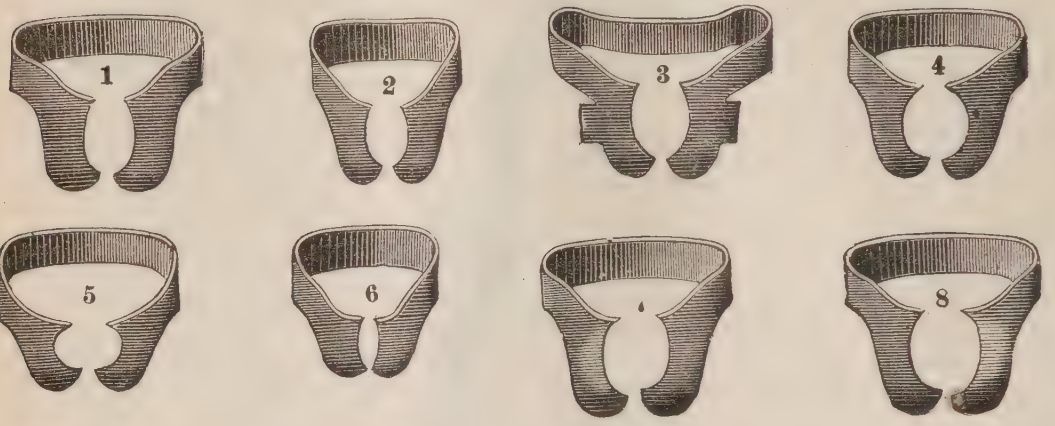
Rubber Dam Clamps,

INVENTION OF

DR. DELOS PALMER, OF NEW YORK.



Price, set of Eight, { Oil finish, $4.00. Each plain, 50 Cents
Nickel plated, 4.80. " Nickeled, 60

For use with Rubber Dam Clamp Forceps.

These Clamps are designed to be placed on the tooth at the commencement of the operation. Afterwards apply the Rubber Dam by passing it over both tooth and clamp.

DESCRIPTION.

Nos. 1 and 2.—Universal Clamp for Molars.

No. 3.—For posterior cavities in molars standing alone.

No. 4.—For third molars, or any molar of a cone shape. This Clamp can oftentimes be turned around while on the tooth, so as to place the bow of the Clamp out of the way of the operator.

No. 5.—For biscuspids.

No. 6.—For lateral and central incisors.

Nos. 7 and 8.—RIGHTS AND LEFTS.—For cavities under the gum, on the buccal or lingual surface of molars.

Cuts of two favorite styles of Rubber Dam Clamp Forceps will be found on another page.

These Clamps have prominent points of marked superiority over those of other manufacturers.

First. Each has been carefully adapted to the shape of the tooth for which it is designed, *under the personal supervision of Dr. Delos Palmer,* the inventor.

Second. A groove is made by us in the clamp, into which the forceps nicely fit, so that the clamps firmly hold their position on the forceps, when once adjusted, instead of tilting from one position to another—as is the case when no groove is provided.

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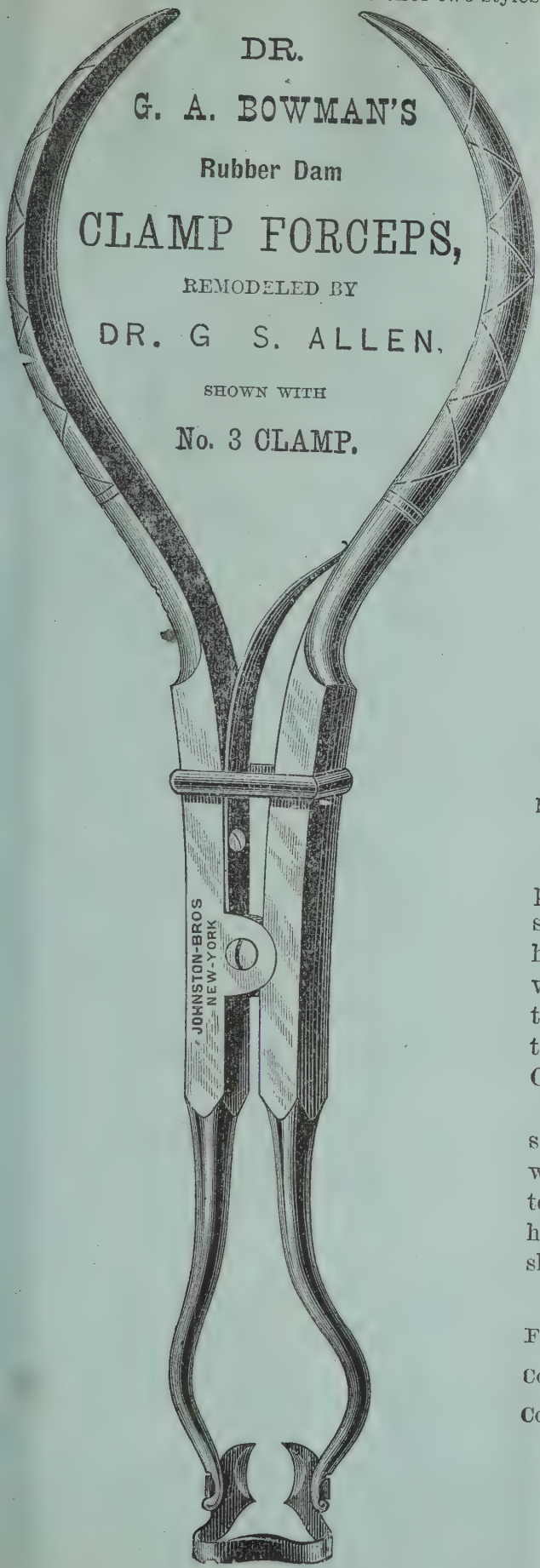

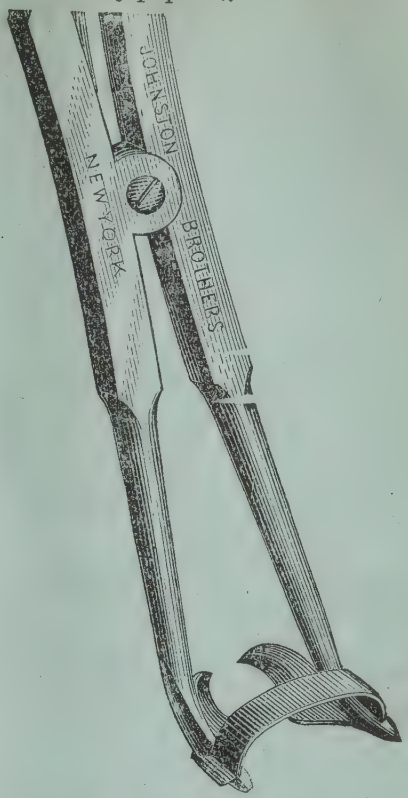

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Shown with Clamp. Handles are exactly like the other style, (Bowman's.)

Both styles of these Forceps have points accurately adapted to the shape of the clamp at the neck, and hence will be found much more convenient than those hitherto offered the profession in this point of adaptation. (See also advertisement of Clamps.)

If so ordered we can supply either style of Forceps with a band, which will keep the Forceps and Clamp extended and ready for use when the hand of the operator is removed, as shown on the Bowman Forceps.

PRICES.

Forceps, either style	$3.00
" " " Nickel Plated	3.50
Complete set of Clamps, embracing eight forms	4.00
Complete set of Clamps, embracing eight forms, plated	4.80
Clamps, each	50
" plated	60

JOHNSTON BROS.
Broadway, cor. 32d St., N. Y.

1878.

JOHNSTONS'

Dental Miscellany

A MONTHLY JOURNAL

OF

AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL AND MECHANICAL LITERATURE.

Its Contributors are Eminent Writers and Practitioners.

It will contain Prize Essays upon the important improvements of the day.

It will contain illustrated articles from Dr. NORMAN W. KINGSLEY, on the treatment of Cleft Palate, Deformities of the mouth, Regulating of Teeth, &c.

The commendation of the Miscellany, received during the last year, has gratified its publishers greatly. They purpose to make the volume for 1878 superior in all respects to either volume that has preceded it. This will be—

1st. Through more frequent contributions from the regular writers who have hitherto favored it, and by promised essays from equally capable practitioners, who have not as yet written for its pages.

2d. By the further reproduction of engravings upon dental subjects. Three such have already appeared, and others are in course of preparation.

3d. By the constant search for, and publication of items of office practice, which serve to show the methods adopted by eminent and experienced dentists to overcome the little perplexities of every-day practice, and to shorten the operations in both laboratory and operating room.

4th. By the reproduction of matter of especial interest which may appear in foreign or comparatively inaccessible publications.

In short, it shall be the constant effort of the editor and publishers to make the DENTAL MISCELLANY of practical value to every actively employed dentist, as well as a source of literary enjoyment to its scientific readers.

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JOHNSTON BROS., PUBLISHERS,

1260 BROADWAY, NEW YORK.

VOL. 5. No. 58.

Johnstons'

Dental Miscellany,

A MONTHLY JOURNAL OF

AMERICAN AND FOREIGN DENTAL, SURGICAL, CHEMICAL AND MECHANICAL LITERATURE.

OCTOBER, 1878.

NEW YORK:

JOHNSTON BROTHERS,

1260 BROADWAY.

JOHNSTONS'

DENTAL MISCELLANY

FOR 1878.

It will be the aim of the publishers to not only maintain the character the Miscellany has acquired, but, by increased care, to make it more than ever an object of desire, if not a necessity, to every practitioner in the country. We have promises of articles from a number of dentists of national reputation, and do not doubt that the volume commenced with this number will be an improvement on either of the four which have preceeded it.

We invite contributions of practical articles from practical men.

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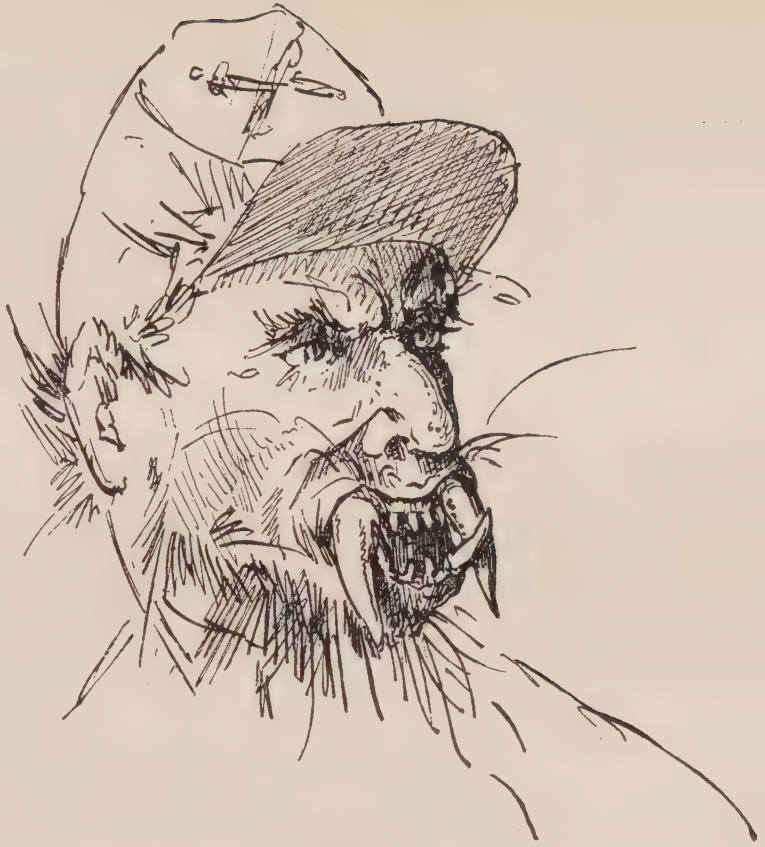


WAR.

The tusks used by this officer in the present war, were borrowed from a guerilla now at the N. Y. Zoological, and will be returned to the owner after the war.

PEACE

JOHNSTONS'

Dental Miscellany.

VOL. V.——*October, 1878*——No. 58.

TRANSPLANTING—RESETTING.

BY DR. A. J. VOLCK, BALTIMORE.

I have read, with much relish, the various reports lately published in the dental journals on the subject of transplanting, resetting, budding and root-pruning of natural teeth, and of the marvelous and invariably satisfactory results attained. How any one can doubt that teeth can be transplanted, just like young beets or turnips, and be better and more flourishing than ever, is a marvel to me. That any body, interested in the character of the profession, should look grave when reading the accounts of the root-pruning indulged in on such occasions, and the perfectly satisfactory results attained thereby, only proves how much our profession has as yet to learn. The smile I perceived on the countenance of one of our most eminent practitioners, while reading the account of the planting of a tooth which had lain dry and dead for weeks in the drawer of a celebrated doctor of dentistry, as related in one of the late numbers of your journal, filled my heart with pity, and I resolved to add my testimony as to the perfect feasibility of such operations.

The fact is, the enterprise of operators who have experimented on this line of dental practice has stopped far short of what can be done.

I have on many occasions inserted into the bleeding cavities left by the extraction of teeth, cows, sheep or pigs' teeth, with perfectly satisfactory result, and my practice has been for many years to keep on hand, for the use of patients with small means, a graduated lot of ivory pegs,

shaped like teeth, which can be planted quite successfully. These pegs can be trimmed to match, before the teeth which they are to replace are extracted, and can be run into their places at once—the shape of the root being of no consequence whatever. In cases where nature has made a mistake in that harmony which ought to assist in the different parts of the head forming expression, these mistakes can easily be corrected, so far as the teeth are concerned, by giving the pegs such shape and inclination as will produce the desired effect.

A bill will be presented in the next session of Congress, in which I propose—for a reasonable remuneration—to plant ferocious looking fangs into the mouths of the United States troops. These will produce such a fearful expression as will strike terror into the heart of the painted savage, and will greatly shorten our Indian wars. After the war these fangs may be re-extracted and deposited at the arsenals for use in the next war, while the peaceful soldier can be planted with meek-looking sheep, cows, pig or calf, or goats' teeth, or with pegs of ivory, walrus or hickory, as he may choose, all of which will grow tight at once, and will be infinitely better than their original predecessors. I append two photographs illustrating this process.

THE AMERICAN DENTAL SOCIETY OF EUROPE.

The Sixth Annual meeting of this Society was held September 2d, 3d and 4th, in Paris, at the offices of Drs. Crane and Kingsley, 7 rue Scribe. This Society, which is composed of the *élite* of the profession practising in Europe, was organized in 1872.

The President, Dr. C. M. Wright, of Basel, Switzerland, called the Society to order. At the calling of the roll the following gentlemen were present: Drs. Wright (Basel); Paetsch (Berlin); du Bouchet (Paris); Jenkins (Dresden); Cohën (Hamburg); Pritchard (London); Fûchs (Berlin); Dumont (Berlin); Crane (Paris); Kingsley (Paris); Sachs (Breslau). The following dentists having applied for admission, were unanimously elected members of the Society:

Dr. Wm. R. Patton.....Cologne.
Dr. Thos. S. Murridge.....London.
Dr. John Greenfield.....London.
Dr. Gardner.....Madrid.
Dr. Edwards.....Madrid.
Dr. E. A. Bogue.....New York.

Dr. W. H. Barrett.....Paris.
Dr. Claude Rogers.....London.
Dr. L. S. Sheffield.....Paris.
Dr. John Maynard.....Paris.
Dr. H. Poate.....London.
Dr. Elof Forberg.....Stockholm.
Dr. George J. Pack.....London.
Dr A. W. Merriam. .....Lyons.
Dr. G. W. Cunningham.....Dublin.

The minutes of the last meeting, held at Interlacken, were read and adopted.

Dr. BARNARD, of New York, was invited to participate in the discussions.

The following were elected officers for the ensuing year:

President—Dr. N. T. Jenkins, Dresden.

Vice-President—Dr. F. P. Abbott, Berlin.

Secretary—Dr. J. W. Crane, Paris.

Treasurer—Dr. C. M. Wright, Basel.

Executive Committee—Dr. Paetsch, Berlin; Dr. McDowell, Frankfurt; Dr. Patton, Cologne.

The Society next proceeded to the discussion of the following subjects :

1st. Influence of Diseased Teeth on Other and Remote Organs.

Essayists—Dr. G. W. Field, Dr. C. Kingsley, Professor James Trumann.

2d. Modes of Manipulating Gold in Filling Teeth.

3d. Incidents of Office Practice.

4th. National Types of Teeth.

5th. Plastic versus Gold.

Essayists—Dr. C. M. Wright, Dr. N. S. Jenkins, Dr. Alfred Füchs, Dr. J. W. Pritchard, Dr. George Cunningham.

Some very interesting papers upon all of these subjects were read, and the discussions which took place had certainly the desired object, i. e., that of encouraging the diffusion of knowledge in Dental Surgery amongst the fraternity expatriated and practicing abroad.

The Society wound up its proceedings by a banquet given at Vachette's, Boulevard Montmatre, where an opportunity was afforded the members to promote intercouse and generate fellowship.

JOHN W. CRANE, *Secretary.*

LOSS OF BLOOD IN SURGICAL OPERATIONS.

Read before the American Dental Society of Europe.

BY ALFRED FUCHS, BERLIN.

MR. PRESIDENT,—I would like to say a *few words* about a new method in *surgical* operations—of operations without a loss of blood. This subject, though not *directly* touching our restricted department of dental operations, must yet be of a certain interest to everyone here present, and might even eventually be applicable to certain cases of our own speciality.

The plan is to isolate, by a series of transverse ligatures, the part to be operated on, and the inventor, Dr. LANGURBUCH, of Berlin, claims that he can cut away for instance the lower (or upper lip), or a part of the tongue, without the loss *of a drop of blood.*

The advantage of this is obvious. If the patient can be safely and deeply chloroformed, without fear of blood flowing into the larynx, the operation can be performed without undue haste and with a *certainty* of having taken away ALL the affected parts. The patient is not weakened by loss of blood.

Operations of the *tongue* were especially difficult on account of the abundant bleeding, which also makes it almost impossible to ascertain if the affected part has been *entirely* excored. By this novel method of procedure now these difficulties are as entirely done away with, as is the possibility of fillings getting wet since the invention and universal application of rubber dams.

The method of procedure will be best illustrated by a case in practice. Patient, a girl nine years of age, suffering of a cancerous tumor on the back of the tongue, which burst from time to time and bled profusely, so much so that the child's life was endangered.

The patient was chloroformed deeply, and the lower jaw lacerated to bring the posterior part of the tongue well forward and in view—the tongue is then grasped with a cross-forceps (by an assistant) and dragged as far as possible out of the mouth A large curved needle, armed with ligature silk, is bored into the upper surface, right in the centre of the tongue, and pushed right through—two or three centimetres behind the tumor to be extirpated—the point of the needle is then turned towards the lower jaw (at a right angle to the tongue), and the needle carried

through the mucous membrane of the floor of the mouth back into the mouth one-half of the tongue, and the lingual artery running along the lower border of the tongue is thus secured. The same thing is then done with the other half of the tongue. The ligatures are then drawn together very tightly and knotted, and the long ends hanging out of the mouth serve to hold the tongue in position.

The tumor was excored, a few drops of blood escaped from it—not a drop from the part of the tongue left. The wound was sewn together, and the ligatures cut and drawn away.

GOLD *VERSUS* PLASTIC FILLINGS.

Read before the American Dental Society of Europe, Paris, September 4th.

BY DR. J. W. PRITCHARD, LONDON.

The subject given is too wide to be exhaustively treated within the limits of an ordinary paper, therefore I trust your essayist will be pardoned if he simply offers some of the results of his practice in England during the past eight years with two forms of amalgam.

On commencing practice there my prejudices were shocked by discovering many large and many small cavities filled with sable-colored amalgams. Some were purpleish black on the surface of the plugs, without much discoloration of the dentine, others had discolored its dentine markedly. On suggesting to the patients that they should be removed and gold inserted, I was frequently asked *why* do you wish to change them for gold? Because they are black and unsightly. Can any one see them when I talk or smile or yawn? No!

Are the teeth decaying about the fillings? The walls of the cavities are so discolored, I cannot see to tell you positively that they are decaying, but I must confess that I cannot effect a lodgment with my finest air probe between the plug and the teeth.

How long do you think they will last? Possibly three or four years. Well, Doctor, I must surprise you by informing you that these fillings have been in my teeth for ten, fifteen, eighteen and twenty years.

I was surprised at first, and could only fall back upon their unsightly appearance and criticism, which was met by the common sense and slightly sarcastic reply, you alone will see them, and if it is not too great

a shock to you, would it not be better not to disturb them, as you can inspect them as often as you deem necessary? A few such rebuffs served to clear away some prejudices I had *acquired* against all amalgams; and now, having seen thousands of these fillings, and having, as far as was convenient, inquired into their histories, I have learned, to my own satisfaction, that *in some teeth and in some positions* the binary compounds of mercury and palladium and a precipitate of copper with mercury (or Sullivan's cement, as it is called in England), are far more durable and beneficial to the patients and dentistry than gold fillings are, as inserted in similar teeth and positions by the large majority of reputedly good operators.

Cavities having strong walls, and which are accessible for rapid insertion of the filling, and which may be kept dry, and where much abrasion during mastication may be expected, may be filled with better results with palladium than with Sullivan's amalgam.

Cavities difficult of access for the rapid insertion of the filling, and where it is impracticable at the time to keep the cavity dry, such as distal surfaces of molars at the neck and below the gum, cavities in deciduous teeth, when it is impolitic to disgust or frighten our little patients with napkins or rubber dam, are better filled with Sullivan's amalgam. Also teeth with weak enamel walls, but of fairly good quality, and in which the dentine is somewhat decalcified, the latter frequently being hardened, as where osteo plastic or Hill's stopping has been used.

The palladium is furnished in a finely divided state, and must be mixed with mercury quickly, and rapidly inserted into the cavity, care being taken to keep it cool by blowing upon it or by constant movement of the mass, and to have a sufficiency of mercury while mixing it, or combustion may take place with a slight explosion.

As it is usually set within two minutes, the cavity must be dried and quite ready for filling. It becomes exceedingly hard, and I believe will resist abrasion better than gold.

The Sullivan's amalgam is softened by heating in an iron spoon—crushed in a mortar, some soap then ground into it, and then washed repeatedly with hot water—dried by rubbing upon a napkin or warming in the iron spoon. The surplus mercury should be squeezed out through a napkin. A larger quantity of mercury may be squeezed out of a portion by means of washleather and a pair of pliers—we then have, by using larger or smaller pieces of both portions, a means of regulating the quantity of mercury in the filling—which take five or six hours to harden, hence may be worked into the cavity slowly and carefully.

AMERICAN DENTAL ASSOCIATION.

Eighteenth Annual Meeting.

TUESDAY EVENING SESSION.

The meeting was continued at eight o'clock Tuesday evening, President Rehwinkle in the chair.

On motion, the rules were suspended for the transaction of miscellaneous business.

REPORT OF THE TREASURER.

Balance on hand, 1877	$288 64
Cash received for dues	770 00
	$1.058 64
Disbursements	$899 95
Balance on hand	$158 66

On motion, the chair was instructed to appoint two members to fill vacancies on the committee for prize essays, and Doctors Pierce and Morgan were accordingly named.

Dr. Sheppard presented the following minority report from the committee on sections :

Minority Report.—The undersigned members of the Committee on Sections, did not sign the report with the majority, for various reasons :

They were and are in doubt as to the wisdom of dividing the Association into sections, but as the opinion of the members in favor seems to predominate, they would recommend that the experiment be tried. They would also recommend that at first the sections should be few in number, and then subdivided as may seem desirable. As a resolution is of no effect in opposition to the Constitution, they beg now to present, without further argument, a minority report in the following draft of amendments to the Constitution :

ARTICLE III.

Sec. 3. Insert the words "and membership of the sections," between the words "to office," at the end of the sixth line, and before the words "none being eligible," at the commencement of the seventh line.

ARTICLE V.

SEC. 6. Strike out the sentence "they shall also report to the Association upon any and all appliances which may be placed in their hands," near the bottom of the seventh page of the printed Constitution.

ARTICLE V.

SEC. 6. Page 8. Under head of "third division" strike out the words "names for Standing Committees for the ensuing year and" between the words "they shall report," and "the names of places."

ARTICLE VI.

Strike out all five sections of Article VI, and insert a new article, as follows :

SEC. 1. To prepare, arrange and expedite business, this Association shall be divided into six sections, as follows :

1. Artificial Dentistry, Metallurgy, and Chemistry.
2. Dental Education.
3. Dental Literature and Nomenclature.
4. Operative Dentistry.
5. Anatomy, Physiology, Histology, Microscopy and Etiology.
6. Pathology, Therapeutics, and Materia Medica.

SEC. 2. It shall be the duty of each permanent member to inform the Recording Secretary, before the close of the morning session of the third day of the annual meeting, which of the six sections he elects to join for the ensuing year. He shall be free to follow his own preferences as to the particular channel in which he will labor, but can be a member of but one section during the same year.

SEC. 3. It shall be the duty of the Recording Secretary immediately after the close of the above morning session of the third day, to make out lists of the names thus furnished of each section, as a basis for the election of officers of said sections.

SEC. 4. The Association shall, by vote, assign some time after the regular election of officers of the Association, for the meeting of the several sections for organization.

SEC. 5. When the time for the organization of the sections has arrived, it shall be the duty of the Recording Secretary to furnish some one member of each section with the list of members of his respective section, which member shall thereupon call the members to order, and read the list of names. The members shall then elect by ballot, a chairman, and such other officers as they may see fit.

SEC. 6. The chairman shall preside at all the meetings of his section. Shall exercise general supervision over the business, and shall see that the labors of his section are conducted in the manner calculated to secure the best results. The chairman, or such other member or members as the section shall select, shall prepare and read at the annual meeting of the Association next ensuing, a paper or papers on the advances and discoveries of the past year in the branches included in the section. The reading of such papers shall not together occupy more than forty minutes.

SEC. 7. The several sections shall meet at 10 A. M. on the morning of the first day of the annual meeting of the Association.

SEC. 8. For the information of all members, a list of the members of each section shall be published in the transactions of each year.

ARTICLE VIII.

Under "order of business" insert, between Nos. 1 and 2, the words 2 meetings of the sections at 10 A. M. Change present No. 2 to 3, and have it read "Organization of the Association at 11 A. M."

Change No. 3 to 4.

Change No. 4 to 5, and strike out the words "standing committees," and insert the word "sections."

Change Nos. 6, 7, and 8 to 7, 8, and 9.

Strike out all of No. 9.

Respectfully submitted,

L. D. SHEPARD,
J. N. CROUSE.

When he had concluded reading the report Dr. Fillebrown moved that it be accepted and lay on the table with the majority report. Carried.

Resuming the regular order of business, the report of the Committee on Physiology was called for. Dr. M. S. Dean, chairman, responded.

DENTAL PHYSIOLOGY.

Dr. Dean read his report on dental physiology, which, while it did not present any new developments in relation to the subject, gave a sufficiency of matter for discussion and elaboration. It first dealt with the rudimentary germs of teeth in ruminants, and gave the conclusions of certain investigators who have sought for the presence of those germs in fetuses of that order. He took exception to the claims of Goodsir, on the ground that they need greater verification, or must be abandoned altogether. The investigations of Drs. Pietkiewierz, as also of Dr. Fones, result in like conclusion. The next point was the consideration of the third

and fourth dentations. Reports of the appearance of third and fourth sets of teeth in the mouths of aged persons are not uncommon, but must be rejected as unfounded, no one of them on investigation being proved to have foundation in fact, and the idea of reproenacy of this kind in old age was scouted by the author. He mentioned also the tendency of scientific men to be led into errors regarding the teeth. With reference to the opinion of Dr. Magitot, that the form of the tooth is governed by the enamel organ, and not the dental papilla, as is generally supposed, Dr. Dean expresses the belief that Dr. Magitot is correct. The belief of Dr. Dean had been strengthened that the enamel organ is the most passive structure, and is formed by the dental papilla. This question was elaborated to considerable extent, and in a manner highly interesting to the members of the convention.

When Dr. Dean had concluded, his paper being open for discussion, Dr. Atkinson took the floor, and said the able and most excellent paper presented properly belonged to histology. He then made a very scientific and instructive address upon the subject brought up. He gave notice that it was his intention to place before the convention before adjournment certain drawings, etc., which would demonstrate conclusively to the eyes and ears of the members what it is that gives form and direction to the teeth.

Dr. J. H. M'Quillen next read a paper on Physiology, in which he gave an account of the restoration of certain functions or voluntary action of which a pigeon had been deprived by the removal of four-fifths of the upper portion of the cerebrum, while another had died from the effects produced by the removal of the cerebellum.

"The usual phenomena attendant upon the operation followed, viz., profound stupor, the bird standing motionless on the table, with eyes closed, the head sunk between the shoulders and feathers ruffled. When pushed, it opened its eyes and moved the body, and when thrown into the air it flew a few feet and then, on alighting, relapsed into somnolency with an evident obliviousness to surrounding objects until again aroused by handling. By the first of March, 1878, about twenty-three days after the operation, I was surprised at the complete recovery of the voluntary movements of walking and flying, the general manifestation of intelligence, and the fact of feeding itself and drinking as usual. I asked then, and I repeat now, the same question: How are we to account for the restoration of these functions? Is it due to the fact that the small amount of cerebrum left after the ope-

ration assumed the functions of the entire organ, or has there been a regeneration of the part removed? There is but one other case on record that I have met with, where there has been a recovery of voluntary action on the part of a pigeon from which the cerebral hemphiseres had been removed; and I was not aware of the fact until the experience with my pigeon induced me to make a careful examination of the literature of the subject. It must be remembered I only cut out the upper four-fifths of the cerebrum. In doing this, however, the superficial gray matter of the hemispheres, recognized generally as the structure physiologically concerned in the exercise of the faculties of attention, perception, memory and will, was removed."

When he had concluded reading his paper, Dr. McQuillen said that six months after the operation the pigeon which survived the vivi section was subsequently put to death under chloroform and a *post mortem* examination made. On removing the scalp a fibrous structure was found analogous to the pericranium, and, on opening this, a small amount of serous fluid escaped. When the cranial cavity was exposed he found a large amount of a white substance, similar to the cerebral material that had been removed. He placed a section of it under the microscope and discovered that it held bi-polar nerve cells, characteristic of nervous structure. There were those who opposed vivisection, saying "we have learned all we can, don't torture animals any more;" Dr. McQuillen thought his experience had taught him that there was yet much to learn in order that dentists, as alleviators of human suffering, might appreciate what was expected of them and be stimulated to govern themselves accordingly.

We can have no better evidence, said the speaker, of the necessity of experimental investigation in the nervous system than was presented by the statement of Prof. Brown-Sequard, the distinguished scientist, who has succeeded to the chair held by Claude Bernard, in Paris, that most of the conclusions of physiologists and pathologists, in this direction, are founded in error. As he has said, the superstructure is not built upon the rock but on the sand, and that is tumbling about our ears. When Dr. McQuillen had concluded, he was greteed with a storm of applause.

Association then adjourned.

SECOND DAY, WEDNESDAY.—Morning Session.

The second morning session of the annual meeting of the Association

was opened at ten o'clock, in the usual form, Dr. F. H. Rehwinkle presiding.

The report of the Committee on Histology and Microscopy was called for, and the chairman, Dr. G. V. Black, read a very interesting paper on the "Odonto-blasts," the leading features of which were illustrated with and made doubly interesting by microscopical diagrams and blackboard drawings showing that their form is cylindrical, with extensions and lateral processes. They are cells which are not subject to reproduction.

Discussions being in order, Dr. Spalding took occasion to highly compliment the paper of Dr. Black as very important, and as authoritative on certain questions hitherto unsettled—as concerning the formation of original and secondary denture. No further remarks being offered by members, Dr. G. F. Waters, of Boston, from the same committee, was called upon to present the next paper. He addressed the convention *extempore* upon "Fungi in the Mouth," giving the results of his investigations with reference to this subject. His remarks were accompanied with blackboard illustrations of what he had found in the way of fungus growth upon the surface of a tooth—and in decay, and in cavities, and in certain food and nuts.

Dr. Waters was followed by Dr. C. N. Pierce, who read a special paper upon The Mechanical Genesis of Tooth Form, showing that force employed by the lower jaw has had its influence in modifying tooth forms.

At the conclusion of his paper, Dr. Pierce presented the general report of the Committee on Histology and Microscopy, which embraces the important announcement that W. R. Gowans, of London, England, had perfected an instrument for the counting of blood corpuscles, whereby he finds that the disproportion of white and red corpuscles is greater than was supposed, the latest research showing 400 red to 1 white. The use of iron, he had also found, greatly increases the number of red corpuscles, even to an enormous extent, without improving the health. This augmentation of the red globules was useless without a corresponding amount of hemato-globulin. The report concluded with a reference to the need that dentists receive a more systematic and thorough training outside of their manipulative work. It was the knowledge which would fit them to deal with those stubborn anæmic cases which are so productive of *neuritis.*

By a vote of the Association and on recommendation of the Committee, Dr. W. H. Atkinson next read a valuable scientific essay written by Dr.

C. F. W. Bœdecker, D. D. S., of New York, a non-member of the Association, the subject of which was the preparation and treatment of specimens of the teeth and gums for the microscope. It showed considerable research upon the part of the author, and brought forward a number of new views upon heretofore disputed questions.

Prof. T. L. Buckingham discussed the formation of dentine. The foundation of all organized tissue, he said, was the cell, from which comes another cell similar to the first, the same as an animal from an animal, etc. In other words, it was a system of reproduction, the cells multiplying very rapidly, in some instances a cell growing in two or three minutes. In time the germinal matter becomes hardened and forms material, while the cells it has produced go on producing. An aggregation of cells will sometimes produce a dissimilar cell. In the tooth the germinal matter is pushed in or down, and the material or dentine is left behind.

Dr. Atkinson followed Prof. Buckingham, and said that those who were depending upon the views of authors whose books and writings are ten years old, were wasting their time. Cells, he said, are vegetable products, and there is no such thing as a cell in the human body, except so far as they are of vegetated growth.

At the conclusion of the doctor's remarks, he moved that an afternoon session be held from four until six o'clock, to expedite business.

Dr. Spaulding moved as an amendment that the extra session be held Thursday afternoon. Carried.

The convention then adjourned until evening.

DISCUSSIONS ON THE NATURE AND TREATMENT OF THE SO-CALLED RIGG'S DISEASE.

TRANSACTIONS OF THE ODONTOLOGICAL SOCIENY OF GREAT BRITAIN.

By Oakley Coles.

The naming of any disease after the first person who may have described it is generally a source of inconvenience and misunderstanding. In the case of fractures of certain bones in a particular manner, it may not be of so much moment—as, for instance, in Pott's fracture and Colles' fracture ; but when in place of a

distinct and well-marked injury to a bone, we have a pathological condition with which we are only imperfectly acquainted, giving rise to certain local manifestations, of which it is not easy to say whether they are causes or effects of the diseased condition, the inconvenience of a "personal" nomenclature becomes at once apparent. Names, if they are to be really useful, should be based upon some easily recognized pathological change, or some well-marked and more or less persistent symptom; as for instance, such names as Hypertrophy of the Gums, Radicular Odontome. I make these remarks with no desire to lessen or detract from the honor due to Dr. Rigg, of the United States, for being the first to fully enter into a description of a lesion that had previously been but vaguely and uncertainly alluded to.

That the condition known as "Rigg's Disease," is a distinctly marked pathological state, requiring a special name, there can be no doubt.

What that name shall be, may, I think, be wisely left until we are better acquainted with the processes by which a clearly recognizable result is brought about. Meantime it may perhaps be useful to bring together our experiences, with a view to the elucidation of the question.

My attention was first drawn to the matter under discussion nearly thirteen years ago, when I was called upon to remove the tartar from the teeth of a well-known and very hard-working contractor. The lower teeth were all perfect, with only a small amount of tartar on the lingual side of the lower incisors; the upper teeth, however, were covered with a greater amount of tartar, especially on the labial surface of the molars; there was a slight amount of tartar on the bicuspids and incisors, still only a little in excess of that which I found in the lower jaw; the margins of the gums were slightly thickened and everted, but the rest of the mucous membrane was healthy and not inflamed, the gums were free of cast-off epithelium, and the papillæ only slightly enlarged.

The teeth were of a bony yellow color, and soft in texture and semi-translucent in appearance.

The palatine fangs of the upper molars were exposed nearly to their apices, and a roughened surface, doubtless due to minute nodules of tartar, could be felt on the labial fangs; over the left upper central and lateral incisor, a curious recession of the gum had taken place, leaving the necks of those teeth partially exposed.

The area of the recession was distinctly circumscribed and limited to the region of the teeth I have named.

During the last twelve years I have, of course, seen many more cases

of a somewhat similar character, and so far as my observations have gone, the disease occurs most frequently amongst men who are subjected to great mental strain. I have found it especially prevalent amongst civil-engineers, physicians, and barristers.

It also occurs with those who have recently returned from India, and especially where the patients have suffered from jungle fever.

Amongst women it is most prevalent after exhausting illness, after frequently recurring pregnancies, and also associated with an excessive menstrual flow.

My observations have thus led me to the conclusion that the condition is to be classed with "the diseases of modern life," that is, that it is dependent on diverted or impaired nutrition, and is to be regarded as a local manifestation of a general constitutional condition. It may in many respects be looked upon as a localized premature senility.

And this view will, I think, explain the cause of some of the symptoms.

In the so-called "Rigg's Disease" we have absorption of the dental periosteum and the deposition of granulated particles of tartar attached to the denuded fangs of the teeth; these symptoms may or may not be associated with a recession of the gums and alveolus, whilst the expulsion of the tooth from its bony sockett will depend upon its position relatively to the other teeth. Incisors will be generally erupted, whilst molars and bicuspids that have not lost their antagonists will, as a rule, remain on the normal horizontal plane.

It will be seen that we have in the cases under consideration symptoms strongly resembling those that arise during pregnancy and lactation, and which, as I pointed out in a paper which I had the honor of reading before the Society, are doubtless due to impaired local nutrition.

The point will, I think, scarcely be disputed, that an excessive strain or use of any organ or viscus will produce some local manifestation of impaired nutrition more or less remote from the abnormally nourished region. That the evidences of impaired nutrition should be most clearly manifested in those organs with a low vascular supply might, *à priori*, be reasonably expected, and is fully borne out by our knowledge of facts. If we accept this view, we are left the less in doubt as to the cause of the so-called "Rigg's Disease," and the relation between the absorption of the pertosteum of the tooth and the deposition of the tartar on the fangs.

Turning now to the more local points of interest, we find the tartar, instead of being deposited in layers or smooth masses, is granulated and

modulated in appearance, and resembles the "mulberry-stone" variety of urinary calculus. I am inclined to attribute this condition of the tartar not to any special form of chemical precipitation of the salts, but simply to the "accident of opportunity." The tartar is deposited at the points of least resistance, that is, on that part of the tooth corresponding to the depressions on the cancelleted surface of the softened alveolus, and it is on account of this intimate relation between the two that it has been found so beneficial (as Dr. Field pointed out in his interesting communication on the subject) to scrape and cut away portions of the alveolus in addition to thoroughly cleaning the fangs of the teeth.

The question will probably arise as to why this condition of the deposition of the tartar should occur in middle life and not in old age, when the process of senile decay is more complete.

The statement of the case contains an explanation within itself, I think. It is precisely because the conditions of senile decay are complete in the mouths of those aged people who have retained some of their teeth, that we do not find any deposition of tartar (as a rule) upon the fangs.

In old age the changes in the texture of the tooth, the atrophy of the periosteum of the fang, and the recession of the gum and alveolar processes take place gradually, but co-incidently, and the margin of the gum remains to the last in close contact with the fang of the tooth; so much so, that the pain of extracting one of the loose teeth of old patients is often very great.

In the cases we are now speaking of we have a more or less sudden cutting of the vascular supply, and subsequently to the atrophy of the periosteum, absorption, leaving a *cul de sac* in which the tartar becomes deposited. Free access to the alveola cavity having been once established, it is easy to understand how the process of loosening is hastened by the irritation of such foreign bodies as minute granules of tartar deposited on the fangs of the tooth.

The alveolus and gums being extremely vascular, do not recede at the same time that the periosteum becomes absorbed; and hence we have the tooth surrounded with bone and mucous structures, but loose in its socket

I have thus endeavored to show that the condition hitherto known as "Rigg's Disease" is due to impaired nutrition and atrophy of the periosteum of the fang of the tooth, whilst the appearance of the tartar deposited on the fangs is owing to the nature of the surfaces that form the boundaries of the *cul de sac.*

If the view of the case I have brought forward meet with the support of the profession, we shall probably have taken one step towards finding an accurate name whereby we may scientifically speak of this disease, for directing attention to which we are indebted to Dr. Rigg.

The President announced that Mr. Chas. Tomes, who was to have opened the discussion, had unfortunately been prevented from attending the meeting that evening; but he had sent a short statement of his views, which would now be read by the Secretary.

Mr. Tomes's letter was as follows:

"My Dear Coles:

"As I am unable to be present at the discussion, in which I am much interested, and should be very glad to have many points in the pathology of the disease elucidated, I would suggest that the experience of our members should be gathered in reference to the following points:

"(1.) The frequency of the occurrence of the disease in persons of middle life who manifest no other sign of senile degeneration; its occasionally sudden advent; its sometimes acute and comparatively painful course; the abundance of discharge in acute cases; its occasional curability. To me personally these characters would be sufficient to establish its distinctness.

"(2.) The earliest signs of trouble and the results of treatment would seem to point to the immediate margin of alveoli (and doubtless their periosteum) as the primary seat of trouble; and the diseased action not to differ much from caries of bone; but on this matter evidence is very much needed.

(3.) I have certainly seen cases in which I could discover no tartar; these were in an early stage, but still the disease was thoroughly well marked. On the other hand, the occurrence of a small quantity of tartar within the gum is exceedingly common, whilst the disease is comparatively rare. Again, when tartar is present it is often situated some distance above the site of active destruction of the alveoli which is thus going on beyond the range of the tartar. And further than this, tartar is abundantly found on the roots of teeth which have been slowly bared by ordinary senile loosening, and which have presented none of the characteristics of the more rapid disease. So that the conditions under which tartar has, and has not, been met with, so far as my own observations go, would preclude the idea of its having anything more than an acci-

dental connection with the disease. But on this point the experience of a single individual is too small for the drawing of a certain conclusion.

"Regretting my unavoidable absence from the meeting,

"I am yours very truly,

"CHAS. S. TOMES."

The Secretary then read the following letter from Dr. Arkövy:

"BUDAPEST, May 28th, 1878.

"MY DEAR SIR:

"The announcement that Mr. Charles S. Tomes will open a discussion at the next meeting of the Odontological Socity on the so-called 'Rigg's Disease,' gives me great pleasure, inasmuch as I hope to profit by the observations of our excellent fellow-practitioner. All who are engaged in paying attention to oral surgery, besides dentistry *strictissimo sensu*, know how great an importance this disease has, which will be, as I hope, enlightened at your meeting.

"The original paper, where Rigg described the disease, is not in my possession, but by comparison I see that it is very likely the same that we find described by J. Salter, under the title 'False Scurvy' ('Dental Path. and Surgery,' p. 184), and by John and Chas. S. Tomes as 'Absorption of the Alveoli' ('Syst. Dental Surgery,' pp. 511–514); and while the latter remarks that the disease is 'very intimately connected with chronic inflammation of the gums,' both agree in the opinion that 'the causes and pathology of the disease are very obscure' (Tomes), and 'are neither constant nor always intelligible' (Salter). As the best proof of the want of clear intelligence and well-based apprehension on the matter may be regarded the manifold nomenclature used for it; as—besides the above-named—*Pyorrhœa alveolaris*, which is only a symptom 'Catarrhal Inflammation of the Gum and Root-membrane,' &c.

"These circumstances and the urgent daily requirements of practice gave me the motive to inquire into the ground of the subject with all means in my power, and I may say the trial has not been without result; as to success, others will decide.

"During the past year I have been engaged in carefully collecting data concerning specially the etiology and pathological anatomy of the disease, which still wants its own proper scientific name. A good many cases, directed by colleagues, have come under my observation, but I do not yet find them sufficient to consider the inquiry as duly concluded.

There are the microscopical details which are still unfinished, and some minor points belonging to the etiology; notwithstanding I hope you will *for now* kindly remit these details and give me the permission to bring to your kind notice the promise that, as soon as I shall have completed the inquiry, I intend to submit my observations for discussion to the Society. I think three or four months will suffice for the purpose. * * *

"Yours faithfully,

"DR. JOS. ARKOVY."

REPLANTATION.

B. F. C. HOUCK.

As the subject of Teeth Replantation is being discussed by the profession as one of the popular questions of the times, I want to add an item of experience November 30th, 1877, Mr. H., aged 30, called at my office and requested me to extract for him the first right inferior molar. On examination I found the perriosteum highly inflamed; tooth loose; a large cavity in both the anterior and posterior approxmal surfaces, (and to use his words), "it was $\frac{1}{8}$ inch longer than the rest." It is possible that by proper treatment the tooth could have been saved without extracting it, but as I feared an ulcerous formation at the roots, I advised extraction and replantation. After extracting, I applied a weak solution of carbolic acid to the socket, and after rinsing thoroughly with tepid water, I plugged the socket with cotton and allowed it to remain until the tooth was prepared for insertion. Removing the inflamed matter from the roots with a lancet, I next extracted the nerve and filled the canals with gold, burnishing smoothly at the end of each fang, but before so doing I filed off from the end of each fang 1-16 of an inch. I next prepared the crown cavities, and filled temporarily with "Premium" Gutta Percha. The tooth being now ready for replanting I moistened it in tepid water and pressed it carefully into the socket, I then bathed the gums with tinct. anconiti and dismissed the patient until next day. He did not call until the third day after, at which time the gums and adjacent parts were slightly swollen. One week after he accomplished ordinary mastication with little difficulty, and in a month it was as sound and solid as any tooth. I have recently removed the gutta-percha stopping and filled permanently with gold, and as it has grown solid in the jaw again I prophesy for it a future of usefulness.

A QUARTERLY MEETING OF THE SECOND DISTRICT DENTAL SOCIETY WAS HELD ON THURSDAY, OCT. 10, 1878, AT THE OFFICE OF DR. A. N. CHAPMAN, BROOKLYN, THE PRESIDENT, DR. C. F. ALLAN, OF NEWBURGH, IN THE CHAIR.

Incidents of Office Practice.

Dr. C. H. Biddle: I presume you have all received a sample of the "felt foil" manufactured by Mr. Slayton. It occurred to me, last Saturday, that I would give it a trial, and report the result to the Society. I filled two buccal cavities in the first and second right inferior molars for a child thirteen years of age They were teeth I did not feel like filling with gold, I did not wish to put in amalgam, and I was fearful that I would not be able to keep the teeth dry enough, except with great difficulty, to make a good filling with tin foil. The material works exceedingly well. I used it in the form of cylinders, and I found there was great cohesion, the pieces seeming to weld one to the other. The directions say we should use smooth-pointed instruments. I do not possess such instruments, but I happened to have a few broken pluggers, and I used those. It seems to me it is a material we might use often in place of tin in teeth that are liable to decay. It can be used much more rapidly than tin. It is like tin in its manipulation, and takes a finish very much like it. The circular also said we might use gold with it. and it would adhere. I attempted it, but after trying several pieces, I was obliged to give it up.

Dr. A. H. Brockway: I have used the same material for something over a year, in perhaps a dozen cases. I used it when it was furnished in the form of a cake, resembling crystal gold. I like it very well so far, but don't see any special advantage it possesses over amalgam or tin foil, in many cases, except that in tolerably deep cavities it can be used to fill the main part of the cavity, and gold can be welded to it. I made several fillings in that way, and, so far as I know, they were successful, but of course it takes time to test new materials. I would like to ask Dr. Biddle why he would not use amalgam, and wherein would be the difficulty in keeping such teeth dry.

Dr. C. H. Biddle: My reason for not using amalgam is perhaps a prejudice, as I have not been in the habit of using it very much, and my

experience with it has not been such that I have any desire to boast of it. There would not be any difficulty in keeping the teeth dry, only I wanted to get through with the child, as she was very restless. I would like to ask Dr. Brockway whether he uses smooth or serrated instruments?

Dr. A. H. Brockway: I use either, but I think it would be better to use instruments with tolerably deep serrations. I filled a lower molar two-thirds with this material and capped with gold, then broke it up, and the union seemed to be perfect.

Dr. I. C. Monroe: My results are the same as Dr. Biddle's in regard to the adhesion of gold to the foil. I put on the rubber dam and used serrated and smooth-pointed instruments, but could not make the gold adhere, and finished the filling with the felt foil.

Dr. A. H. Brockway: What form of gold was used in attempting to unite the two materials?

Dr I. C. Monroe: I used foil No. 4.

Dr. A. H. Brockway: I used crystal gold. That may account for my success.

Dr. C. F. Allan: I made a filling in a hole drilled in the handle of a tooth brush, and had no trouble in uniting the two.

Dr. C. H. Biddle: I can't see the necessity of using gold with the filling. I merely tried the gold to see if it would do what the circular claimed for it.

Dr. A. H. Brockway: I find it beneficial in cases I mentioned, where cavities in the grinding surfaces of molar teeth are pretty deep. I can fill them almost wholly with this material very rapidly, and then finish with gold, thus saving quite an amount of time and material, and, if it is made from tin, it is a better non-conductor than gold, and therefore better for the tooth.

Dr. W. B. Hurd: Do you apprehend any galvanic action?

Dr. A. H. Brockway: I got over being afraid of that long ago. I would like to ask Dr. Hurd this question: suppose a gold filling to be put on the grinding surface of a molar tooth, and an amalgam filling on the proximal surface, those two fillings being in contact, will there be galvanic action sufficient to make it objectionable?

Dr. W. B. Hurd: If saliva can get between them as they lie in contact.

Dr. A. H. Brockway: That is to say, if the joint be imperfect, so that the saliva can get between, there will be trouble; otherwise not.

Dr. W. B. Hurd: Yes, sir, in every case.

Dr. R. C. Brewster: Two years ago I put a large gold filling into a right inferior wisdom tooth. Six months after the buccal surface crumbled off, and I filled that with amalgam; and that is perfect to-day, and the patient has never had any discomfort from it.

Dr. A. H. Brockway: I presume I have seen thousands of such cases, and I have not seen one that produced any discomfort.

Dr. W. B. Hurd: A short time ago a, lady came to me complaining that she had constant trouble with one of her teeth; so much so that she supposed there was some exposure of the pulp. On examining the tooth, I found that gold and amalgam had both been used in it, and the two fillings were in contact. There was a small point where the saliva came directly between the two metals as they were united. I suppose that took place in less than three months after the tooth was filled. I removed the filling and filled the tooth as well as I could with gold, and the trouble ceased.

Dr. J. N. Farrar: I have met with the troubles that Dr. Hurd speaks of, but when I came to investigate, I found that there was a slight space between the gold and amalgam, so that the saliva could get in there. From some experiments that I am now making, I am led to believe that this is caused by the action of the mercury upon the gold.

Dr. I. C. Monroe: I would like to state a case, for the purpose of asking whether there is any one present who has had anything similar. It is the first of the kind that ever came into my hands This Summer a lady was sent to me, complaining of pain where there was no tooth. She complained also of a pain in the tongue and side of the face. Seven years ago she had the right inferior wisdom tooth extracted, and immediately the pain commenced. She called upon her dentist several times but could get no relief. She was recommended to others, and still getting no better, finally went to a physician. There is no inflammation or swelling, but occasionally there is a little purple spot, about where the tooth was extracted. For the past two or three years the physician has cut it open when it appeared, and then she had relief for a week or two. When it healed over, she would have the pain again. When she came to me the physician had, four or five days before, made an incision there. I put in a piece of cotton, which opened it so that I saw the bone clear and clean. Examining it through a magnifying glass, I discovered a spot full of little holes as fine as a cambric needle, with a mark around it, as though it

was the end of the root. I took the burring engine and burred down, becoming more and more convinced that it was the apex of the root broken off in there. I kept on burring until it became very painful, I ceased for that day. The next time I tried, and I was just getting at the apex of the root, when the burr hurt her differently, and she exclaimed that her lip was paralyzed. That continued rather severely for a few days, but finally passed off to a great extent. I continued dressing it with iodine mosly, and she became very much better; still, she is not entirely free from pain.

The Subject for discussion, THE "NEW DEPARTURE," was then taken up.

Dr. W. B. HURD: Dr. Flagg is an erratic sort of a man, and I do not wonder at his "New Departure." A man that will tell you he can fill a tooth in three minutes with Morgan's gold, and fill it as well as it can possibly be done, as he did a few years ago, is not a good leader. I think every man who uses every material that is beneficial, is using good judgment, but to throw off the old and take on the new, and make that a hobby, as many people do, is ridiculous The cost of the material should not be of any consequence to the dentist. The only thing I see is the saving of labor; there is a great deal of labor saved, and the benefit to the patient is extended. I believe nothing has been discovered equal to gold if properly manipulated, and yet there are thousands of teeth filled with amalgam that could not be filled in any other way. Just after 1834, when this question was agitated very extensively, I became so thoroughly prejudiced that I did not use amalgam for 15 years. At the expiration of that time, I found I had been sacrificing thousands of teeth that I might have saved with amalgam.

Dr. A. H. BROCKWAY: Is that not a little inconsistent? You say gold is the best material for saving teeth, and yet by using gold you sacrificed many teeth that could be saved.

It is said there is nothing new under the sun, and what is known as the "new departure" verifies that saying. It is not new: the practice which it recommends is not new to many people, but the sharp distinction which it makes is between the teachings which have prevailed for the past 15 or 20 years, and the teachings which the new departure would inculcate. It is a matter of record that for the past 15 or 20 years, until recently, gold has been advocated as the best material for filling teeth, and when we speak of filling teeth, of course we really mean saving

teeth. Now here come men who say that gold is not the best material for saving teeth, and I agree wholly with them in that statement. I do not believe that any tooth can be saved better with gold than with amalgam. I do believe that a good many teeth can be saved better with amalgam than with gold. I do believe that many teeth can be saved better with several other materials than with gold. The question of the expense and labor involved in the manipulation of the one material or the other is another consideration. It seems to me that the new departure is simply applying common sense to the process of filling teeth. Even those who are most rigid in their advocacy of gold are forced to admit that many teeth can be saved as well with other materials. Dr. Hurd admits that a large number of teeth which he sacrificed, might have been saved were it not that his prejudice against amalgam stood in the way. His experience is precisely like mine, except that it covers a longer period. I was brought up under Dr. Westcott's teachings to fear amalgam, and for a number of years I did not dare to use it, but my observation of the success which others had in saving teeth with amalgam, and my common sense were constantly admonishing me that my practice was incorrect, and I have gradually used, as I think, more common sense and more plastic materials, as I have grown older; just before I came here I looked over my book, simply to show this tendency on my part. In November, '73 I made 109 fillings, of which 45 per cent. were gold. In December, '75, I made 151 fillings, of which 38 per cent were gold, showing a diminution of seven per cent. in two years. In October and November, '76, I made 342 fillings, of which 26 per cent were gold. I think my present per cent. of gold is not more than that, possibly less. I see in December, 1873, I had occasion to refill 29 cavities, originally filled by myself and others, of which 18 were gold fillings and eleven were plastic materials, including gutta-percha, oxy-chloride of zinc, amalgam and tin, showing that a larger per cent of failures were with gold. I think if the record were carried to any extent it would preserve the same proportion. We know that amalgam and all plastic materials have been used in the most doubtful cases, gold having the advantage every time, and yet the record shows that a far greater percentage of failures are with gold than with plastic materials.

Dr. W. B. Hurd: We often find teeth that have been filled with gold for 25 and 30 years. A short time ago, there came under my observation a set of teeth that were filled 20 years ago; they were in a perfect state of preservation, and beautiful to look at as well. Is there any

better material for filling than the material they were filled with? I have filled teeth with amalgam, and filled them as well as I knew how, and have found the fillings in less than six months, all loose in their places, and I have refilled them with the same result. I have taken the same teeth and done my duty with gold, and there they have stood for years. The old fashioned doctrine of gold fillings, properly put in, is the best I think.

Dr. A. H. Brockway: I am doing precisely what I have been doing for a good many years, except that perhaps I am ceasing to fill extensive cavities in pulpless teeth with gold. I did a good deal of that years ago. It was the doctrine then, as all can bear witness; it was almost worth a man's reputation to stand up against it, a few years ago.

Dr. Wm. Jarvie, Jr.: While I think that Dr. Flagg has said some very good things, and while I think that some of his articles will have a good effect upon the dental profession at large, yet I cannot agree with him fully, neither can I agree with what has been said here this afternoon. I believe that gold, in the great majority of cases, is the very best material that we can possibly use to fill teeth; but there are many cases where it is not the best, and the question is, which are the cases where some other material should be used? I believe that amalgam will *not* save all teeth as well as gold. Amalgam is an uncertain material, and so is any material that changes its shape after it is placed in the tooth. often, when for some reason, we have taken unusual pains with amalgam filling, and it appeared to be perfect, we have, after a time, found that filling bulging out and imperfect around the margin from the change in form. We know that all bodies that are not solid tend to a spherical form, and it is so with amalgam. Gold properly inserted will not change its form afterward, and if you leave the filling perfect it will remain so.—Take the medium-sized cavity with strong walls, and for saving teeth there is no material that can begin to approach gold. Gold can be inserted and finished, and the surface of the tooth left in a condition far safer than by the use of any other material, except perhaps tin. Pulpless teeth, in the back of the mouth, with the cavity in the posterior approximal surface, extending beyond the margin of the gum, that we would work over three or four hours with a great strain upon the nervous system of both patient and dentist to fill with gold, I think should be filled with amalgam. A good amalgam filling is very much easier inserted than a perfect gold one, and so in a large majority of such cases I should prefer it. In teeth that are badly broken down amalgam can be used,

and it will preserve them for many years and form a good surface for mastication ; oxychloride of zinc, as a rule, soon dissolves away and needs renewal, but there are cases where the renewal year after year is better than the loss of the tooth, it being in such condition that we cannot make a perfect filling of gold. We must exercise judgment in determining the material to be used. A dentist who uses but one substance for filling teeth will do less service to his patients than one who uses almost every material that we have in common use.—Gold, gutta percha, tin and amalgam, all have their uses, and I think we should not be able to save as many teeth were we to lose any one of them ; cavities are constantly presenting themselves to us in which one of these materials is the best to use. My proportion of gold fillings is far more than twenty-six per cent., but if I thought amalgam would save any tooth just as well as gold, amalgam being far less expensive, and its insertion causing far less nervous strain upon the patient, I would put in very few gold fillings. I was with a dentist for four years in Boston who would never use any material except gold for filling teeth during that time. I commenced practice with the same idea, but they have gradually given way, until I use almost all the materials that we have ; yet, for more than a majority, perhaps 75 per cent. of all the fillings I put in I use gold, because I believe it is the best material for the case. Sometimes another material might preserve the teeth equally well, but, if it were tin or amalgam, it would disfigure the tooth. In the case of all the teeth in front of the second bicuspid we must take into consideration their appsarance as well as their preservation.

Dr. A. H. Brockway : I see that Dr. Jarvie and I, while perhaps slightly disagreeing in theory, are practically pursuing the same practice, the difference between us is only a difference in degree, and is not so great as would seem. If Dr. Jarvie has not taken his estimate from his books, but guesses at it, I think it very likely he may find that his percentage of gold fillings is not so great as he supposes. Mine is not so great as I supposed it was, and, I think, among the better class of practitioners 75 per cent. of gold fillings would be an unusual number, that is taking temporary teeth and all ; of course, if you take the permanent teeth alone, the percentage will be much larger. I bear in mind the consideration of the appearance, and I would not use an amalgam filling that would discolor the teeth ; where the appearance would be a great objection, I should prefer to use gold even if I did not think it was the best material for saving the tooth, on account of its appearance.

Dr. W. B. Hurd: It is utterly impossible for any man to get up such a statement as Dr. Flagg has done, with a thorough understanding of what he was saying, and when he undertook to depart he intended to depart in whole. Has the whole dental profession been blind for years? Why have we told our patients that gold is the best material? Because our observation has taught us this very thing. What our eyes have witnessed we believe. You know very well, gentlemen, that there is one class of operators in our profession that invariably produce beautiful operations, and there is another class of operators that produce the reverse of it. A man should not only have the observation, but he should know what a good filling is. I never saw the veriest quack but believed in amalgam; it was easily put in, and he did not know how to do the other thing. The best men in the profession tell you that gold is the best material; the worst men tell you that amalgam and soft materials make the best fillings. At least that is my observation.

Dr. Wm. Jarvie, Jr.: I believe that Dr. Flagg is thoroughly honest in his assertions, and I admire his pluck in coming before the bodies he has, to promulgate his views, in the face of such opposition as he knew he would meet there. He does not stand alone, as Dr. Hurd thinks, but is in conjunction with Dr. Palmer, of Syracuse, and Dr. Chase, of St. Louis. These gentlemen have each taken a department, and worked it up very carefully, and, after two or three years' experiments, have agreed upon this creed. Dr. Palmer has made special observation of the effect of the different materials and their compatibility with tooth substance.

Dr. C. D. Cook: "The New Departure," so-called by our distinguished friend, Dr. Flagg, of Philadelphia, is, to my mind, not a new departure except in its excess. These gentlemen seem to be intoxicated with a new idea. They discard the better thing, in many instances, and take the poorer. I have heard this subject discussed several times, and, of course, the most attractive and amusing speaker, has been Dr. Flagg, of Philadelphia. His wit and humor have always been ready to come to the surface to help him out of any straightened condition into which his remarks may have led him him. For 25 years I have been in the habit of using amalgam. I have not filled all the cavities presented with amalgam, or gutta percha, or oxy-chloride of zinc, since they have come into use, but have used them all as my judgment dictated, and, in some instances, as my patients desired. The way to save teeth is to fill them with any material that is presented to us that has, in certain cases, advantages over every other material that we know of. I cannot

see any objection to using amalgam, but it seems to me that the same impression is to be made upon those who are coming into practice of dentistry, that was made in the use of crystal or cohesive gold. There was scarcely a student coming from any of our dental institutions who could fill teeth decently with soft gold or tin foil. They could fill teeth elegantly, possibly, with cohesive gold, but they only had one leg on which their stool or chair could stand. It seemed to me the very first point in filling teeth with any material, was lost by not teaching them to use tin or soft gold first. From that teaching they would necessarily be better operators. Then come these other materials. It is easy, comparatively, to make an amalgam filling. May I ask why dentists on the Continent, in England, Scotland and Ireland, where amalgam has been for years the chief material in use, are now coming to learn how to use gold more efficiently? Why have they not come to the front as the best savers of teeth if, "in proportion as teeth need saving, gold is the worst material to use?" It would seem that a good deal of energy is being wasted, and will bring no gosd result, except in so far as we are stimulated to greater care in the manipulation of gold. It seems to me that we are getting too much of the new departure, as it may have a tendency to detract from the use of gold. That gold has not always been used in proper cases, our own failures can testify. We have tried to do something that we found could not be done. I have seen operations where the gold was well packed, but the teeth were not worth the labor and expense of putting it in. Such fillings would inevitably fail, and some of the plastic materials are better for the saving of such teeth.

Dr. Thos. Fry: I have read Dr. Flagg's paper, and I am inclined to look at in a philosophical manner. I think it is a special providence at this particular time. A great many of you know there are men who believe that nothing but gold should be used for filling teeth, and I honor those men for the high standard they have taken in the past, and the great excellence they have shown in their operations. Now, I know it to be a fact, that a great number of those gentlemen happen to be in a position, where they do not see the worst cases of the destruction of the teeth, and I know they do not know how to fill teeth with amalgam. I think that a man to fill a tooth with amalgam, should believe in its importance, and feel that he can do it. Then I believe he is justifiable in putting in an amalgam filling, if the purse of the patient or the difficulty of access of the cavity would render it impossible to put in

a gold filling properly. Now I believe the lesson that Dr. Flagg would inculcate, is to make dentists choose their cases, and make good operations with amalgam. If they do so, a great number of people who are not able to have their teeth attended to now, could have them cared for because of decrease in expense. If the great body of the people of the United States can be brought to understand, that it is not the material that is used, but the skill with which it is used, thousands of people would have their teeth attended to. I never put in an amalgam filling where I think a gold one ought to be, but I can put in a good amalgam filling when the patient is not able to pay for a gold one. I am just as careful in the preparation of the cavity, in the placing and finishing of an amalgam filling, as I would be with a gold filling.

Dr. A. H. Brockway: I do not share the apprehensions that so many seem to feel, that the teachings of Dr. Flagg will result in lowering the standard of excellence, but I do believe that his teachings and those of his confreres will prove of vast benefit to the community, and to the dental profession. Every speaker I have heard to-day, while professing to oppose it, has in reality admitted the main article of the creed, that is: "In proportion as teeth need saving, gold is the worst material to use." Every man that I have heard speak, has admitted that he uses amalgam and plastic materials in those teeth that were so frail or so badly decayed, as to render their preservation by the introduction of gold a matter of great uncertainty, and that is the whole gist of the first and main article of the new departure creed. The newness of it consists in its promulgation, rather than in the doctrine itself, or the practice it represents. We know what has been the accepted and taught creed for 15 or 20 years. How do we know it has been the acccepted and taught creed? By the discusssons of the dental societies, by the teachings of the dental colleges, and by the impression that prevails among the public to-day. How frequently do we hear patients say that they want gold used, because it is the best material to save the teeth. Where do they get that idea? From the teachings of the dentists with whom they have been in contact, the last 15 or 20 years. It is startling to most people to tell them that gold is not the best material, in every case, to save teeth. I wish every one would read the article of Dr. Palmer in the August number of the Cosmos; it is so instructive. (Reading from it). "In support of the "New Departure," as a distinct practice I have nothing to say, as a distinct practice because I draw no lines between the old and the new. The changes which have

occurred in my own administration have been gradual ; an exchange of failures for successes, just in proportion as I have been able to associate cause and effect, and apply the proper remedies to prevent failures."

Dr. C. D. Cook : One word as to the new departure creed ; it is eminently calculated to deceive ; it is very carefully worded. All teeth that are of use are worth saving, as a rule. Now I do not find a dozen large cavities in the mouth of a young or old patient, that one would put amalgam in, if it were left to one's own judgment. One may find three or four of those large and desperate cases ; teeth that need saving. There are a number of medium sized crown and proximal cavities, in good dense dentine, or fairly so. Now, it is very easy for a good operator to save those teeth with gold, I fancy ; I suppose we have all seen that.

Dr. A. H. Brockway : That is admitted by Dr. Palmer.

Dr. C. D. Cook : Dr. Palmer is not the man to whom exception is taken. He is not the prominent man, the figure-head. He is the gentleman who has steadied this very unsteady kite. He is the man to whom they refer, when they want a mature, fair statement of the facts, as I understand it. Nobody takes any exception to his teachings, as far as I know ; if they do take exceptions, it is on the electrical or scientific basis. Now, as to the prominent man in this matter of teaching the new departure, what has he done ? Put upon his appointment card "no gold used." He does not use gold in his office for filling teeth. What does that mean ? It seems to me that the impression has gone abroad that the plastic material is *the* material in the mass of fillings, and in the mass of fillings is it ? Dr. Brockway's statistics, unless we know the proportion of temporary fillings, are not trustworthy.

Gutta-percha, when subjected to wear, is in no proper sense a permanent filling.

Amalgam—how does it fail ? I occasionally see a good amalgam filling ; I have seen some such that I made, but I have seen more that others have made, particularly Dr. Clowes. What do we *know* about amalgam ? What does any man know about amalgam ? Not what he "guesses." Do we not all *know* that *large* amalgam fillings after one, two or three years are sure to give away on the one side or the other ? The man does not live, as far as I know, that can give the precise formula by which the *common* amalgam can be put in the tooth, and bring uniformly good results.

Cheapness of operations, next to the saving of teeth, has been urged by its advocates as one of the advantages of the "new departure." If,

in the use of amalgam, we take the care, that has been so persistently insisted upon by thosewho are best capable of giving it the majority of operations can be performed nearly as quickly, and so as cheaply, with gold, as we take our fee according to the time occupied. Then we have a beautiful, clean denture instead of one made unsightly by the use of a material that is sure to cause discoloration, and that is altogether unfit for use in the front teeth.

I do not understand tin to be a plastic material as some of the speakers intimate. If it is so considered, then I claim the same for soft or non-cohesive gold foil.

Dr. A. H. Brockway: A good deal of the talk on the new departure has been not to the new departure creed, but to Dr. Flagg. What his individual practice may, be has nothing to do with what the new departure has laid down in the creed. It is intimated that Dr. Palmer does not subscribe to the new departure. (Reading from the article by Dr. Palmer): "The principles advocated by the "New Departure," as I understand them, concede the use of gold as a filling material, wherever and whenever it can be used for the preservation of teeth as successfully as other materials."

Dr. C. D. Cook: That is Dr. Palmer.

Dr. A. H. Brockway: Yes, sir, he was one of the men who drew up the creed. You cannot go back of his statements.

Dr. C. D. Cook: I did not understand that Dr. Palmer did not subscribe to the creed of the new departure, but that he was more conservative than the creed. What I intended to say, was that he was the most conservative man, and did not press these statements to the front as the other two have done. He is very careful in what he says, and no one, as far as I know, takes exception to his statement of what he thinks the new departure to be. What Dr. Flagg and Dr. Chase think the new departure to be, is a very different matter.

Dr. A. H. Brockway: We have their own words of what they think the new departure to be, and we cannot go back of their statements, nor can we say Dr. Palmer holds views differing from theirs, because he says he subscribes to the new departure as he understands it. (Reading from article by Dr. Palmer): "The new departure begins where gold leaves off, to help gold, if need be, to sustain its exalted reputation, and to furnish a substitute in other materials in cases where gold is inadmissible."

Dr. O. E. Hill: As I sat here and heard Dr. Brockway describe the new departure, I thought it was entirely a misnomer. There is no new departure in that. The only thing new is, that they are trying to force it upon us a little stronger than they ever did before. Gentlemen, I think the great fault of our profession is that it seizes everything in the most extreme manner. We do not take a conservative view of anything. I do not subscribe to this new departure, as I understand it. But I do subscribe to it thoroughly as I have practiced it ever since I have been in the profession; that is, to fill with soft material when I think it is the best, depending entirely upon my judgment. If I ride a horse too fast and go blindly, I am very sure to go to destruction, and if I use either of these materials in that way, I do more harm than good. If they are used with judgment and discretion, we want them all; and by using them all, we can do more good than with any one of them. I am utterly astonished at the persistency of Dr. Flagg in pushing this to the extreme he does. I think it is unnecessary. I think he does more harm than good. In regard to Dr. Elisha Townsend, Dr. Flagg quotes him one way, and gentlemen produce letters that are quite the contrary. I think Dr. Townsend tried to take a conservative view. That is the way I look at this whole thing. I hope the time will soon come when of all these subjects we shall learn to take a conservative, common sense view, and that is, above everything, the most scientific.

Dr. G. W. Brush: When I first began to fill teeth I did as I was taught. I recommended gold in every case where I thought it was possible to put it, and I put it in to the best of my ability at that time, and to my mortification, in many instances, my patients would come back with large gold fillings failing. They had perhaps paid a high figure for the filling, and I found myself obliged, in view of the condition of the tooth then, to substitute an amalgam filling. It has ever been my aim to work for the interest of my patients, to be conscientious in my work, and do it as thoroughly as my ability would allow. And it was a question in my mind whether I was doing the best thing for them to recommend, in a large cavity, gold, even though it was well put in, when, if the walls broke, as they were liable to do, and the gold came out, I had to substitute an amalgam filling. Would it not have been better in the first instance, to put in an amalgam filling and take the chances? Lately I have adopted the method of filling these teeth with amalgam more than formerly, and, I think, to the benefit of of my patients. I think Dr. Hill hit the nail on the head when he said

this question resolved itself into a question of individual judgment and individual manipulative skill. I believe all these materials are good under certain circumstances. If I had a case where I wanted to make the operations look nicely, so that in looking into the mouth I should feel some pride in the appearance of it, I should put in gold wherever I could; but the question is whether that is always the chief thing to take into consideration. The principal thing is how best to save those teeth, so that they will be useful to the patient. So far as the new departure is concerned, when I read the first article of the creed, as it is called, I was rather taken aback, but when I came to think it over and look at it from the standpoint from which I think it was intended to be looked at, I thought it was not so bad after all.

Dr. O. E. Hill: There is the opportunlty for me to make the point I wish to. I say that Dr. Brush was wrong when he filled that tooth with gold, and also when he filled it with amalgam. That amount of metal in a tooth of the quality he speaks of, is all wrong. If you are filling with gold, fill the cavity half full of oxychloride of zinc, and then cap it with gold, or, if you wish to use amalgam, do the same thing, or, if a metal surface is not necessary, use Hill's stopping.

Dr. G. W. Brush: I agree with Dr. Hill on that point.

Dr. C. P. Crandell: From the reports of societies, and from what we read in the journals, we have reason to believe this subject is very generally discussed, and must be regarded as of some interest. I, for my part, am rather glad that Dr. Flagg has taken the position he has. When he says "no gold used," we know where to find him, it is right to the point. You will scarcely find any half-dozen gentlemen who are using the same amalgam. We have in Dr. Bogue's scientific experiments an effort to determine which is best amalgam, and the proper method of using it—anything like that is looking to something desirable. This matter of choice of material requires a great deal of discretion. I never expect to attain entirely satisfactory results to myself and those who criticise my work, and to my patients, for reasons patent to us all. If Dr. Flagg would follow up this matter, to get at the truth, and give the profession the benefit of it, it might result in producing something in the way of amalgam and plastic materials better adapted to saving teeth, and more permanent than anything we now have. If he would devote as much effort and enthusiasm as he has thus far in presenting this to the profession, to emphazing the necessity of greater painstaking in their use, and would

advocate some thoroughly established principle or method of using these various materials, there would very much good come out of it.

Dr. H. G. Mirick: As the question is reduced down to the praise of amalgam, I would like to say a word. I think, perhaps, among ourselves, it may not do any harm to say that we use amalgam; but it seems to me that this endorsement of amalgam by so many old dentists, will really do more harm than good to those coming into the profession. I think any one who has had 20 or 30 years experience, has found out how to use it, and where it will do the most good. But I really think this recommendation by old men of amalgam, as extensively as it is done now will do us harm as a profession; it will put us, in many respects, on the same standing that they are abroad. It is said, that amalgam will preserve a great many teeth as well as gold would. There is no doubt that these little fillings (if made of amalgam), would in a great many cases be just as efficacious, as far as the mere preservation of the tooth is concerned. There is no doubt that a front tooth, filled with amalgam, would be preserved, but would it be as satisfactory in appearance?

Adjourned.

GEO. L. MASON,
Recording Secretary.

"BLEACHING TEETH."

"WHAT IS THE BEST METHOD OF BLEACHING TEETH?"

J. TAFT, D. D. S.

This question is frequently repeated, not only by those afflicted, but by those who would remedy the difficulty.

The above query is just at hand from a dentist of acknowledged ability, and long experience. It is proposed, in this instance, as doubtless it is in many others, not because the questioner is ignorant of any method of treating discolored teeth; he may be, and we presume is, familiar with good methods, but the question arises from a desire to know the best method, and that which will meet the greatest number of cases.

A full answer to this question involves many points, more, perhaps, than can be discussed here. This discoloration is not that which is found upon the surfaces of the teeth in the form of deposit. Rarely indeed does the enamel become stained or discolored beyond the surface. The exceptions are found only in enamel of defective structure, or when it has been deteriorated by some disintegrating agents.

The dentine is that part of the tooth usually involved in objectionable discoloration. This structure is variable in its susceptibility to coloring agents; in some cases readily taking up coloring material, in others resisting its entrance. This variation in susceptibility is dependent upon the condition of the dentine in respect to density or the opposite condition. In early life, or at any time before maturity, the teeth are more liable to discoloration than later in life. The age of the patient. therefore, is an important circumstance in the condition of the subject.

The teeth of different persons at the same time of life differ greatly, some being relatively quite soft and much more easily penetrated by foreign material than others; with others they are so dense and structurally so good that they become discolored with great difficulty, if at all. In almost all cases devitalization of the dentine takes place before it is discolored. There is an apparent, perhaps real, exception to this found in those instances in which decay has, by a change of condition, been arrested, the dentine in such a cavity of decay, is dark or even black, and still endowed with some sensitiveness in the dark part; this, however, is not often found.

In order to decide as to the proper course in any given case, the peculiarities and suceptibilities must be recognized and estimated.

A correct comprehension of the cause of the affection in question, is an important consideration, one that can not be overlooked if the best results are to be obtained.

The teeth are sometimes discolored by decomposition of the contents of the tubuli—the soft solid part of the structure. This is more liable to occur in the teeth of young persons, especially when the manifestation of the vital principle is feeble. This decomposition does not always produce a very marked discoloration, but it does frequently give a dark, muddy, unsightly color, that makes quite a contrast with a living, healthy tooth. This condition is liable to occur in any tooth that has lost its vitality, whether decayed or not.

Again, discoloration of a red, purple or brown hue sometimes occurs by the entrance of the coloring matter of the blood; this can only take

place where the constituents of the red corpuscles are separated and the cruorine in solution. This is the more likely to take place under stress of some great violence. The teeth of persons who have died from strangulation, by either hanging or drowning, are sometimes of a purple hue. Arsenious acid applied in small cavities for the removal of sensitiveness of dentine, will sometimes produce this discoloration. Instances of this mode of discoloration are far less frequent now than when arsenic was in common use for the treatment of sensitive dentine. The penetration of this material, like others, varies in different cases, sometimes being little more than superficial, at others, extending throughout the dentine, especially of the crown of the affected tooth.

The teeth often become discolored by the imbibition or foreign material that accumulates, and is retained in cavities of decay till decomposition takes place.

The teeth are frequently discolored to a very marked degree by the compounds of oxdyzable metals that are used for filling teeth. Rarely, if ever, is any compound of tin or silver taken up by dentine ; they are never found in the mouth in a condition in which that can be done.

Mercury is largely used in compounds and mixtures for filling teeth, this, when in excess and subjected to the temperature of animal or blood heat, will pass into vapor. Mercury is volatile even at low temperatures, and quite so at the temperature of animal heat ; its vapor is exceedingly subtle and penetrating. Mr. Henry Watts, in his Dictionary of Chemistry, vol. iii, p. 884, says : "Vapor rises from mercury between + 15.5° and + 27° (but not at 6.7°) both in vacuum and in spaces filled with air, as shown by silvering of gold leaf kept for two months in a vessel over mercury." (Faraday + 7°.)

According to Karstan, mercury at a temperature below 0.° gives off sufficient vapor to bring out the image on a daguerreotype plate held over it.

Brame found that sulphur in the very finely divided utricular condition into which it is first precipitated from the state of vapor, is a much more delicate test for the presence of mercurial vapor than gold leaf. By means of this test he finds that at + 12° the vapor of mercury rises to a heighth of more than a meter—that even at + 8° it appears to have no limited atmosphere ; that it rises at ordinary temperatures from amalgams and mercurial ointment—that in presence of air and sulphur vapor it diffuses according to the same law as other gases."

Mercury, as used in connection with other metals to form material for

filling teeth, is in excess of the other metals employed ; and in the mouth the conditions are favorable to the formation of vapor. Free mercury being present, and in a temperature of 38° it will necessarily vaporize ; this vapor possesses great diffusability, and will permeate almost anything permeable with which it may come in contact. The penetrating power of this vapor is greater than that of any other extraneous material with which the teeth are usually discolored. Its oxydation is readily affected when in contact with air or moisture, at ordinary temperatures ; and the color then presented is that so often found in teeth that have been filled with amalgam. The discoloration from this material is sometimes found only upon the surface, but frequently it penetrates more or less deeply into the dentine, in some cases extending wholly through it, thus depending upon the susceptibility of the structure together with the prevention of the vapor from surface escape.

These are some of the ways in which teeth become discolored so as to render bleaching desirable.

How this may be best accomplished is the question.

There is no *single* method that is of universal application, that will accomplish the object in all cases. Cases of like forms and conditions will be amenable to about an uniform treatment.

The first things, then, that claim attention upon the presentation of a case, are the character, condition and the cause of the discoloration. In the treatment of this discoloration, two modes of procedure are available, viz : first, by the use of the proper cutting instruments remove the affected part ; and, second, by decomposition of the coloring material, which usually destroys its objectionable character.

By the first method, the removal of the dentine, as well as the coloring matter in it, is affected. This course is only practicable where the discoloration extends but a little way into the dentine, or when the body of dentine is sufficient to admit of the requisite cutting, for the removal of the objectionable part.

In all cases when the teeth would be much weakened by this mode, it should not be employed. But it is practicable when the offensive part may be cut away wholly, or, as in some cases, in part only, then by the introduction of some light substance that will reflect the light, neutralize the objectionable color in the tooth, to some extent at least.

Cutting away a part of the darkened dentine may so expose other parts that bleaching agents may be brought in contact with the substance to be acted upon.

When the employment of the second method, viz : decomposition, is decided upon, the following things should be noted : First, The nature of the substance to be decomposed. Second, The depth of its penetration. Third, The decomposing agent. Fourth, The method and facility of bringing the bleaching agent in contact with that upon which it is to act, viz : the coloring material. Fifth, The influence of the agent employed may have upon the tooth structure with which it may come in contact.

The different material with which the teeth are liable to be discolored, vary much in the facility with which they may be decomposed ; some are permanent compounds, others feeble ; some may be simply washed out, while others will resist the influence of every agent that is practicable in application ; some are so stable that they remain unchanged though the tooth-bone in which they are lodged should be dissolved. Therefore a correct knowledge of the character of the material with which the teeth may be, or are, colored, is important to him who seeks its removal.

Teeth deeply stained by the coloring matter of the blood, are not easily freed from the discoloration, from the fact that this stain seems to take a firm hold upon the tissue and agents that will decompose, it will act upon the dentine as well.

The oxide of mercury, or indeed of any of the metals oxygenisable in the mouth, cannot be decomposed in the substance of the teeth, nor indeed in contact with them, except by agents and processes that would at once be destructive to them. But to this statement the criticism may be made that cyanogen readily decomposes oxide of silver, and terchloride of gold, but to this it is only necessary to reply that the teeth are never stained wtth the gold-chloride, nor with oxide of silver, except upon the surface, and then cyanogen may be employed for its removal.

When the oxide of mercury, or any anologous substance has found a lodgment in the dentine, its removal is only practicable by cutting away the affected part. Chlorine and sulphurous acid are the chief bleaching agents. Cyanogen, while it acts with energy and promptness upon some substances, fails wholly to operate on others, and the danger in its use would forbid its general adoption.

Chlorine is perhaps more used in bleaching teeth, and rightly so, than any, or possibly all other agents put together. In speaking of this subject, Dr. Watt, in Chemical Essays, page 117, says : "Chlorine, which has been termed 'the great bleaching agent,' as is well known, has a

strong affinity for hydrogen, and sometimes bleaches by taking this element from the coloring compound, and sometimes by taking hydrogen from the water present, thus liberating the oxygen, which in its nascent state is able to decompose the coloring matter by taking its hydrogen and carbon. In many instances of chlorine bleaching, the processes take place simultaneously, and are not in the least incompatible with each other.

"Oxygen, as it exists in the atmosphere, sometimes bleaches (and sometimes dyes) by virtue of its affinity for elements or compounds contained in the coloring matter."

In the employment of chlorine various processes have been adopted. Free chlorine has, by a properly formed and adjusted tube, been thrown into the decayed cavity of a tooth to be bleached; by this method the desired results have hardly been realized. Chlorinated fluids have been used, but generally with indifferent results.

The more frequent, and by far the best application, is the hypochlorite of lime. In Chemical Essays, page 127, Dr. Watt says: "In bleaching with this salt a number of reactions occur. The lime may be regarded as the pilot or engineer that conducts the acid to the place where the action is desired. Its direct action in promoting or retarding the bleaching process is of no practical importance. Chlorine has long been recognized as the great bleacher; but disputes have arisen as to how it bleaches. Some maintain that by its affinity for hydrogen it decomposes water, and the liberated oxygen, with the advantage of its nascent condition, does the bleaching. Others claim that it takes the hydrogen of the coloring principle, and thus bleaches directly. But there is no occasion for dispute, for both positions are correct.

"It has been said that hypochlorite is constantly giving off the acid, and also that the acid itself is decomposed under all ordinary circumstances. Now, bearing in mind that this acid is composed of one equivalent of oxygen and one of chlorine, by its decomposition their active elements are simultaneously liberated, having equally the advantage of the nascent state, and therefore are far more energetic than if previously free; the oxygen spends its force by taking the hydrogen and carbon from the coloring principle, while the chlorine either takes hydrogen from the coloring matter, or from the water present, in which case another equivalent of nascent oxygen is set to work.

"From this it is seen that one equivalent of hypochlorite of lime (containing, of course, one equivalent of hypochlorus acid) has as much

bleaching power as two equivalents of free chlorine, or two of nascent oxygen."

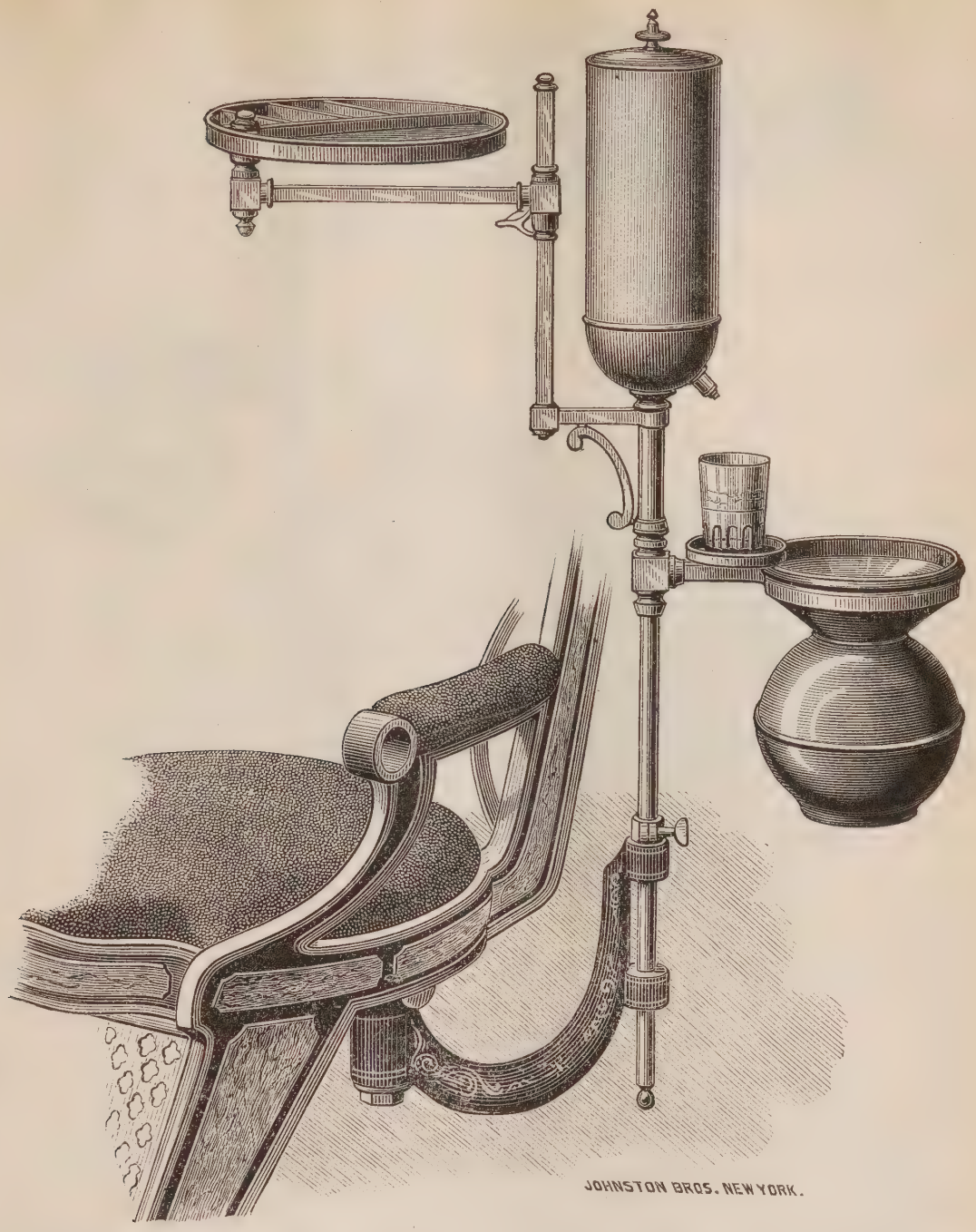
There is therefore (perhaps) no better compound of chlorine than that with lime just referred to. Care, however, is requisite, lest by its too frequent application, serious injury is done to the tooth—one or two applications at most should be sufficient in any case. Another advantage possessed by chlorine over any other bleaching agent, is its greater power of penetration, and so greater ability to reach the material upon which it is to act.

We trust that a careful consideration of the suggestions here made will lead in some measure at least to an understanding of the principles involved in treating discolored teeth.—*Dental Register.*

OPIUM HABIT—HAS IT ANY PROPHYLACTIC OR REMEDIAL EFFECT ON CONSUMPTION?

The proceedings of Richmond Academy of Medicine, published in the March number of the *Monthly*, interested me greatly, especially the remarks on the "Opium Habit," which is a growing evil all over our country, markedly so in the West, where the Chinese are introducing the custom of smoking the drug. I mention the subject more especially now to elicit the views and experience of the profession regarding the influence of its habitual use on tuberculous diseases. My life in the West has brought me in contact with many Chinamen, and I have yet to meet the first case of consumption among them. Other physicians, to whom I have mentioned the subject, confess the same experience. I have no data or statistics to prove such an idea, and no new theory to advance; but if it could be proven that opium does prevent or check the progress of this class of disease, it might aid in working out an improvement on the present treatment. Do not understand me as wishing to popularize such a fearful remedy, but cases might occur where it would be well to use it. With all its fearful effects, it cannot be worse than the habitual use of alcohol, which is now so popular a remedy for tuberculosis—the "remedy often proving worse than the disease," and leading to more serious results. Thirty years experience of the New York Mutual Life Insurance Company shows *twenty per cent.* of total deaths was due to consumption, and these were selected cases, almost exclusively from the stronger sex—a large majority having passed early manhood when examined. Truly, this disease is the worst enemy to the human race.—*Virginia Medical Monthly.*

WILKERSON RESERVOIR SPITTOON—AND BRACKET.



This attachment to the Wilkinson Dental Chair is designed to satisfy a want long felt by those of the profession who are so situated that a supply of running water is not readily obtained.

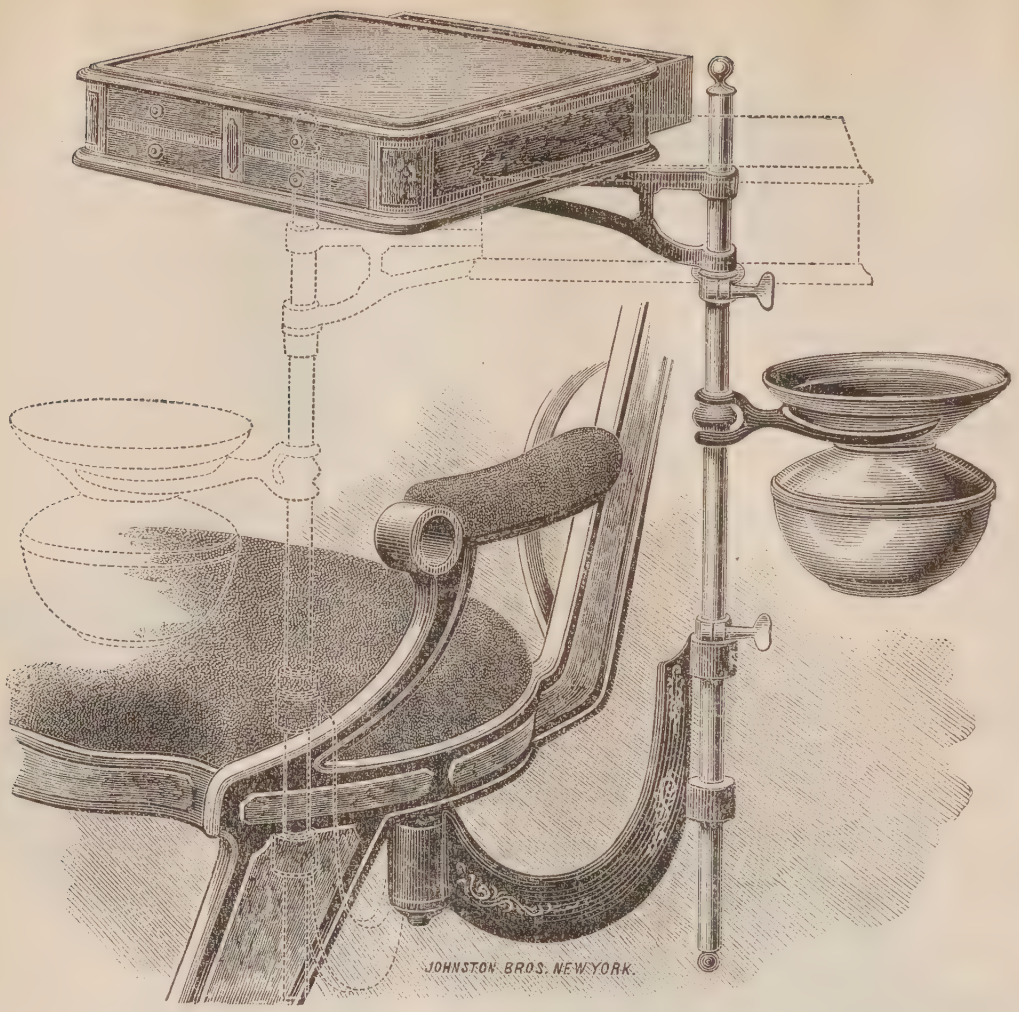
By reference to the illustration accompanying this advertisement it will be seen that a Reservoir of water is supported above the Cuspador, upon a nickel plated column, which in turn is held firmly by a japanned arm which swings freely from the side of the chair. It is very strong, and imparts its own steadiness to the whole apparatus. The plated column is adjustable vertically, and can be secured at any height as compared with the chair that may suit the requirements of the operator By simply lifting the rod that projects through the centre of the cap of the Reservoir a valve in the bottom of the Reservoir is opened and a gush of water is permitted to pass to the Cuspador, the funnel of which is so constructed that its whole surface is flushed and rinsed by the water. The capacity of the Reservoir is sufficient to rinse the Cuspador twenty times. The attachment of the Cuspador is such that it is readily removed when it is desirable to empty it. It is provided with a gold trap of the latest and most improved form. A glass and faucet for drawing water from the Reservoir is provided.

The bracket table is so constructed that it can be raised and lowered by one hand, and is so mounted on the post that it can be placed in any position the operator may desire. *The whole attachment is highly finished and handsomely nickel plated.*

Price..... $50 00

JOHNSTON BROS.,

1260 Broadway, N. Y.



COMBINATION WILKERSON CHAIR ATTACHMENTS.

STYLE 1.—As shown in cut, including nickel plated spittoon, with gold trap, and Allan bracket table, also with nickel plated tumbler holder.....$40 00

This table of walnut, handsomely ornamented with French walnut, is fourteen inches square and three inches deep. It has one drawer, fitted for about one gross of engine instruments; two drawers adapted for gold preparations, and two for filling instruments.

STYLE 2.—Same as above, with a porcelain cuspador instead of the nickel plated spittoon..... $32 00

STYLE 3.—Same as style 1, except with Morrison bracket table instead of Allan table..... $32 00

STYLE 4.—Same as style 1, except with Morrison table and porcelain cuspador, instead of Allan table and nickel plated spittoon..... $24 00

STYLE 5.—Same as style 1, less spittoon and fork, and tumbler holder..... $25 00

STYLE 6.—Same as style 1, but with Morrison table instead of Allan table, and less spitton, fork, and tumbler holder..... $17 00

STYLE 7.—Attachment and nickel plated spittoon and glass holder (no bracket) $25 00

STYLE 8.—Same as style 7, except with porcelain cuspador instead of nickel.. $17 00

NOTE.—We can supply a few very fine rosewood bracket tables—Morrison style—fourteen inches square and one inch deep, at four dollars each above the price with Morrison walnut table, or four dollars less than where the Allan table is supplied.

For plain cheap spittoon see Chair advertisement.

NOTICES.

We need thirty to fifty copies of the January, 1878, No. 49, issue of the *Dental Miscellany*. For clean copies we will allow 25 cents each. Send them in and notify by P. O. card that *you* sent them.

BACK AGAIN.

For six months we have occupied the building next the corner of Broadway and 32d Street, the building recently occupied by us on the corner having been torn down to make room for a new one.

The new building is now up, and our friends will find us comfortably ensconsed in a fine room, on the second floor of the corner building, (No. 1260 Broadway)—with nearly fifty feet front on each street—with entrances on either. The 32d Street entrance will shortly be provided with the latest improved passenger elevator.

We are conveniently reached by the Metropolitan Railroad—elevated—the 33d St. station of which is close by us—time from down town, fifteen minutes—the University Place cars (Broadway road), the Sixth Avenue cars, and the cross-town cars, running from Grand Street, East River, to 42d Street and North River, all pass our door. It is but four blocks from the Fourth Ave. cars, (from the Hudson River, the Harlem, and the New York and New Haven R. R. depots) to our store.

To all of the Dental Profession we extend a cordial invitation to call on us, whether needing supplies or not.

JOHNSTON BROS.

1260 BROADWAY, cor. 32d St.

LIQUID NITROUS OXIDE.

N O

No other equally safe anæsthetic is known. While Chloroform and Ether are killing scores, if not hundreds, annually, Nitrous Oxide, although used many times as frequently as either of the other anæsthetics named, proves itself entirely harmless; and this too, though very commonly an impure article of Nitrous Oxide is exhibited. The Nitrate of Ammonia ordinarily furnished in the market is far from being chemically pure, and the products of its decomposition are too often impure Nitrous Oxide and Bin-oxide of Nitrogen. The latter is a gas of which the chemist, Brande, says:—"It is rapidly fatal to animals"—and again, (of the reddish fumes which result from its admixture with air, which fumes most dentists have seen while making Nitrous Oxide,) "These are fumes of Nitrous Acid, ($NO^2+2O=NO^4$). They have a peculiar suffocating odor, and are highly irritating and corrosive—*care should be taken that they are not breathed, even in a dilute state.*" All danger from this source may be avoided, however, by making use of *Liquid* Nitrous Oxide, which, being prepared constantly and in large quantities, under the direct supervision of a chemist, is certain to be pure. *No instance* of fatal results following the administration of pure Liquid Nitrous Oxide Gas is known. The following statistics, showing the comparative safety of several of the leading anæsthetics, have been before given by us, but cannot be too often brought to the notice of those who are constantly called upon to relieve suffering by means of these agents.

From a careful examination of the statistics of 200,893 cases, Prof. E. Andrews gives, in the *Chicago Medical Examiner*, the following estimate of the relative danger from different anæsthetics:

Sulphuric Ether	1 death to	23,204	administrations.
Chloroform	1 "	2,723	"
Mixed Chloroform and Ether	1 "	5,588	"
Bi-chloride of Methylene	1 "	7,000	"
NITROUS OXIDE	**no Deaths in**	**75,000**	"

Edward R. Squibb, M.D., than whom our country has no more able pharmaceutist and toxicologist, in a lecture on anæsthetics before the Medical Society of the State of New York, says: "Nitrous Oxide was the first anæsthetic; and the safety and certainty of its effects, even in inexperienced hands, for all momentary operations, and the promptness with which persons recover from its use, render it perhaps the most important of all anæsthetics, because destined to relieve a greater aggregate amount of pain, *with greater safety*, than any other agent."

Again—"If the surgeon considers the safety and saving of pain to his patient, first, and his own convenience in operating, second, he will hesitate before passing over such an agent as Nitrous Oxide."

It may be well just here to call attention to the fact that, when ether or chloroform is administered, it is not at all uncommon for the air about the patient to become so charged with the vapor as to somewhat affect the surgeon, taking from him perfect clearness of mental operation, and of the senses, and frequently leaving him with headache, and even nausea.

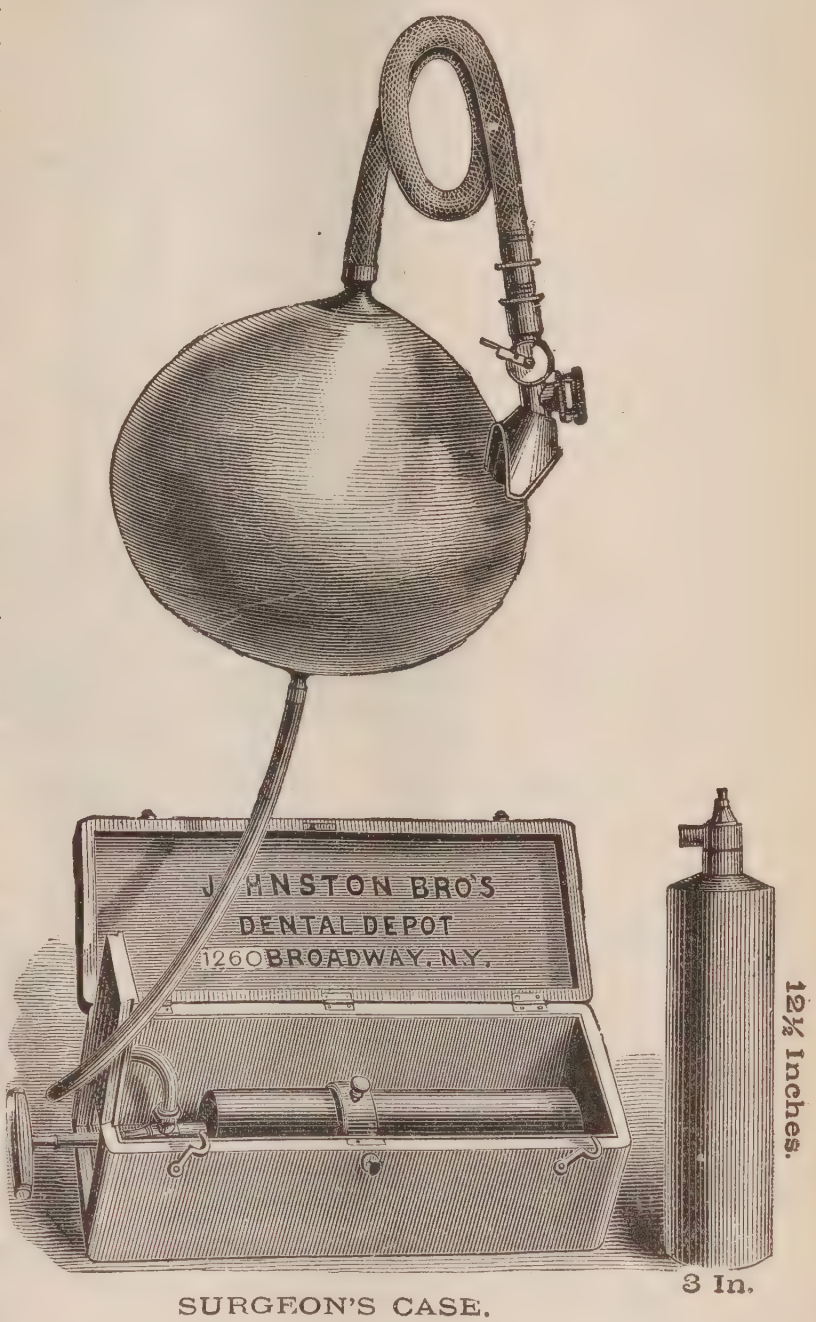
When Nitrous Oxide is given, nothing of this occurs, and the surgeon is in no way conscious of the presence of the anæsthetic, except as he sees its effects on his patient. This, we think, is a convenience to the surgeon.

Numerous and repeated trials of the Liquid Nitrous Oxide in capital operations in surgery, (as well as in momentary operations), during the two years just passed, attest the

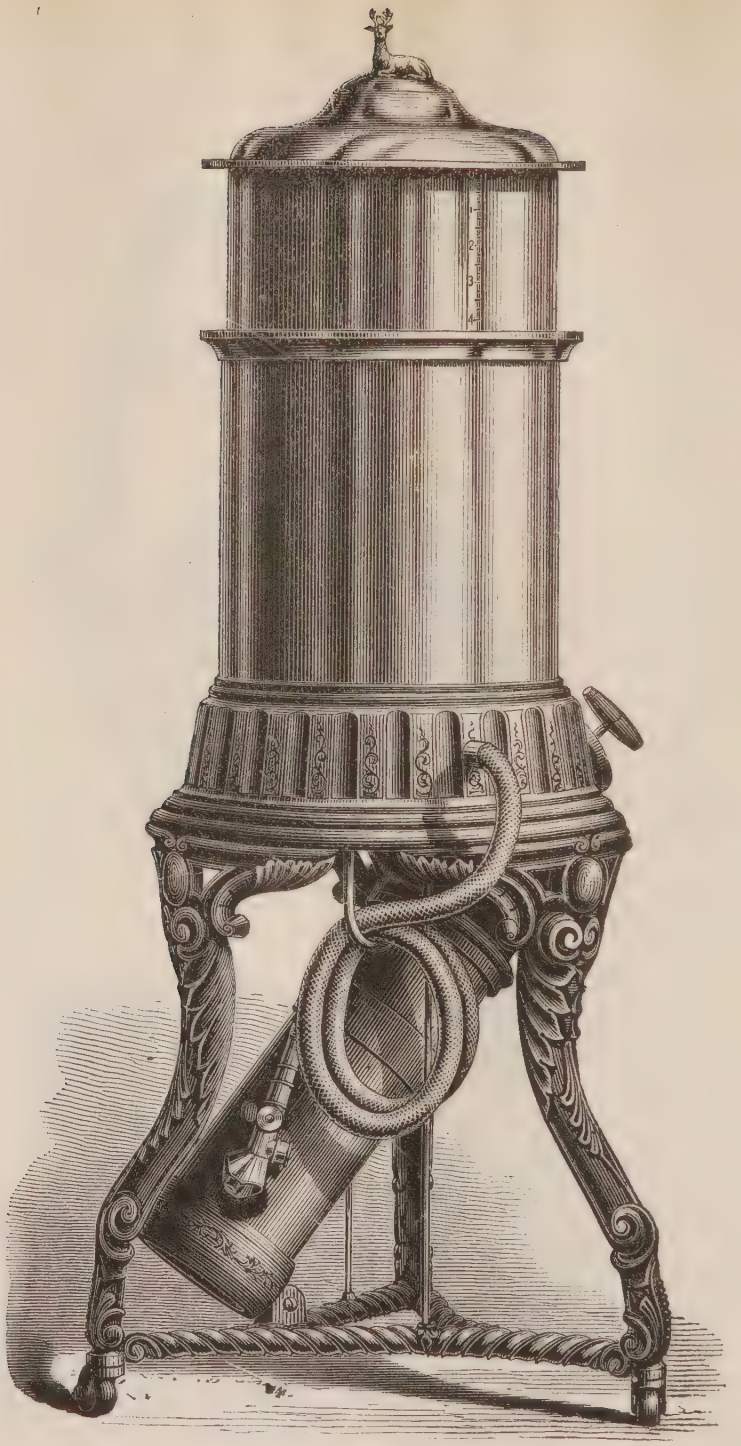
perfect adaptability of this agent to all cases where an anæsthetic is needed, and the time is not very distant when it will supplant its cheaper, but dangerous rivals.

Two styles of apparatus are provided for its administration. The most generally used, because of its cheapness and portability, is the SURGEON'S CASE.

This comprises a strong cylinder containing One Hundred Gallons of Gas; a strong morocco covered case, provided with an iron ring and set screw, by which the iron cylinder is held in place during use, and its delicate valve protected from injury; also, a rubber bag with rubber tube at one end for admission of gas, while an inhaling tube, handsomely covered on its outside, and provided against any possibility of a collapse by a tin-coated spiral of wire on its inside, is fastened at its opposite end; a metallic inhaler—nickled—having two spring valves, which answer to the slightest breath, either of inspiration or exhalation. The inhaler also has a two-way stop-cock or ground valve so arranged, that the gas being shut off, the patient may be allowed to breathe air until all alarm is dissipated, and then, by an unobtrusive movement of the fingers without previous notice, the air may be excluded and gas admitted. It contains also, a nickel-plated wrench and a nickel-plated key. In fact *all* the apparatus necessary for administering the gas. The whole case and contents weighs about fifteen pounds. This is here shown as open, and the bag which receives the gas from the cylinder, and from which it is exhibited to the patient, is represented as filled, and suspended above the case. The cylinder is also shown as standing at the side of the case. This is the simplest and most popular form of apparatus, and will be everywhere welcomed—because of its portability for use outside of the operating room.



SURGEON'S CASE.



NICKEL-PLATED GASOMETER

AND ORNAMENTED STAND

FOR LIQUID NITROUS OXIDE.

NICKEL-PLATED GASOMETER.

This style of apparatus is especially designed for those who use large quantities of Nitrous Oxide, or who may desire a highly ornamental piece of office furniture, coupled with a *really economical* gas apparatus, the gas being furnished in 1,000 gallon cylinders, at a reduction of 25 per cent. in price.

The cut on the opposite page represents the nickel-plated gasometer, mounted on a stand, with a 1,000 gallon cylinder, in position, under the gasometer.

Heretofore, gasometers have been so unsightly, that it has been considered desirable to place them in an adjoining room or behind a screen; we take pleasure now in offering to the profession a gasometer so handsomely gotten up, that it will be an ornament to any office, and at the same time so constructed, as to be vastly superior to any apparatus heretofore used. The gasometer will, when full, hold 10 gallons of gas —this is sufficient to completely anæsthetize any patient. The usual amount of gas given to a patient is from 3 to 5 gallons.

If it is desirable to keep the patient under the influence of the anæsthetic for any length of time, (as in a surgical operation), the operator has under his control 1,000 gallons of gas, by merely turning the key seen in the cut at the right. The gasometer is nickel-plated, highly polished, and mounted on a carved iron stand, which is japanned and ornamented with bronze.

On the bell of the gasometer there is a scale graduated in gallons, and fractions of a gallon, so that the operator can readily see how much gas he has administered.

Another valuable feature in this gasometer, is a peculiar water-check or valve, so arranged that though the gas will flow freely on the lightest inspiration at the inhaler, it is instantly and automatically shut off by the water when the patient stops breathing.

This does away with the necessity of closing any stop-cock, and prevents all waste of gas; it also saves the dentist's time at the most critical moment, as he has only, after having administered the gas, to lay aside the inhaler and proceed at once to operate without the necessity of shutting any stop-cock. The stand is so constructed that a small (100 gallon) cylinder can be used while the large cylinder is being re-filled.

We should also call attention to the fact, that there is no liability to loss of gas from leakage, caused by the operator's leaving the valve of the cylinder open, for if there is such escape from the cylinder, the bell of the gasometer will rise, and the operator will have his attention called to the waste, thus enabling him to correct the difficulty at once.

The whole apparatus is mounted on castors, and can be readily moved.

This apparatus is especially desirable where large quantities of nitrous oxide are used, or where it must be sent a great distance. In this form it is best to ship it by *fast freight*—which makes the cost of transportation very light. The gas can be kept for any length of time, and is constantly on hand *and always of the best quality.*

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.

Why Nitrous Oxide should be preferred to Ether or Chloroform.

1st. It is far safer—see foregoing statistics. Dr. Colton reports having administered it to thousands of patients, without a single accident.

2d. It acts quickly ; from one to two minutes being generally sufficient to bring a person completely under its influence.

3d. It seldom excites a patient to violence—a matter of great importance.

4th. Nausea is not often excited, even during a long operation. Eating, however, should not immediately precede the administration of the gas. It is contended by some operators of large experience, that *pure* nitrous oxide *never* causes nausea. In operations of the eye, or in the pelvic region, this peculiarity renders the gas invaluable, and it always is of much value to the patient's feelings.

5th. The shock given to the system by other anæsthetics, is almost as severe as the operation itself, and a slow return to consciousness and the normal condition detrimental to the recovery of the patient. Nitrous Oxide frees itself from the system as speedily as it produces its effects, and so adds nothing to the perils of surgery.

6th. It is no small advantage, as before recited, that, while using Nitrous Oxide, the operator feels no inconvenience from its effects, as he does not inhale it, while he cannot altogether escape the fumes of ether or chloroform.

REVISED PRICES.

Complete Apparatus—Surgeon's Case, with Metallic Inhaler	**No. 1**	$42 00
Complete Apparatus—Surgeon's Case, with extra sized Bag and Metallic Inhaler	**No. 2**	44 00

Boxing either, $1.00.

Each complete apparatus includes a 100 gallon cylinder, filled with Liquid Nitrous Oxide.

Cylinder with 100 gallons of Gas	16 00
Refilling Cylinder	6 00
Nickel-Plated Gasometer, with ornamented iron stand	128 00
Necessary adjuncts, (including Union Nut, Key-Wrench, Inhaler and covered Tubing)	12 00
1000 Gallon Cylinder	36 00

The above cylinder may contain more than one thousand gallons—say from 1000 to 1200 gallons—for which the price will be at the rate of 4½ cents per gallon, which is 25 per cent. less than the price in small cylinders.

Contents, if 1000 gallons would be, at 4½ cents	45 00
Morocco covered case, with ring and thumb screw, velvet lined	12 00
Polished bl'k walnut " " " " "	13 00

Or these latter we have only a limited number.

Rubber Bag, with covered inhaler tubing, (about 4 gall. capacity)	5 00
Rubber Bag, with covered inhaler tubing, extra size	7 00
Inhaler, latest style, with two way stop cock, adapted to the use of both dentists and surgeons, with connection	9 50
Key, Nickel Plated	1 50
Wrench, "	50
Union, Nickel Plated, (nut and tube), for connecting cylinder and gas bag	1 50
Covered Inhaler Tubing, per foot	50
Plated Connection to fit old style Inhaler	1 00

JOHNSTON BROS.,

Broadway, cor. 32d St., N. Y

THE DENTIST'S APPOINTMENT BOOK
AND POCKET RECORD.

Printed in Carmine and bound in Morocco, with rubber fastenings and card pocket, $1.25

JOHNSTON BROS.

DENTAL PICTURES:

Pictures on Dental subjects are not very numerous, and will always possess interest to practitioners of dentistry. Having reproduced several copies of ancient paintings and engravings, illustrative of dentistry in other countries and in olden time, as frontispieces for the DENTAL MISCELLANY, we have, at the request of friends, also printed them upon plate paper, in suitable form for framing or for preservation in a portfolio.

Those now ready are—

1. Der Zahnarzt—From a Steel Engraving of 1672.
2. The Tooth Drawer—English.
3. The Monkey as a Dentist—From a painting by DeCamps, 1840.
4. Der Zahnbrecker—From a German Plate.
5. Tràns plantation—1787. By Rowlandson.
6. The Ludicrous Operator. By J. Harris, London, 1768.
7. Primitive Dentistry. Scene in Persia by an eye witness.
8. Fifth Pair of Nerves—not colored. From Tomes' Dental Anatomy.

Price each, by mail, 50 cents.

JOHNSTON BROS.,
Broadway, cor. 32d St., N. Y.

FLOSS SILK.

A superior article, per dozen, $1 50.

JOHNSTON BROS.,
1260 Broadway

FRENCH CROWN AMALGAM.

The Manufacturer says of it: The Amalgam is composed of materials which the dental profession at large recognize as the best (except gold) for filling teeth. It is of finest quality. It has the merit of becoming hard in fifteen minutes after being prepared for use, and does not change color or shrink.

PRICES.

1 oz. box, with mercury	$3 00
⅔ oz. " " "	2 00
⅓ oz. in envelopes	1 00

For sale at wholesale and retail.

JOHNSTON BROS., 1260 Broadway, N. Y.

JOHNSTON BROTHERS' LAVA STRIPS.

PATENT APPLIED FOR.

For finishing fillings, a new and unequaled polishing material.

Thinner, more convenient and more efficient than corundum tape.

Price, per Box. ..... 50 cts.

JOHNSTON BROS., 1260 Broadway, N. Y.

Wilkerson Dental Chair.

PATENTED NOV. 20, 1877.

PRICE, $175.

Spittoon Attachment with porcelain Cuspador $6 00
" " metallic Cuspador and gold trap..... 14 00

The cut is a good representation of this unique chair. The acknowledged requirements of a first-class dental chair have been here secured by Dr. M. B. Wilkerson—the inventor—by methods showing great originality. All cranks are dispensed with and levers substituted for them. The chair is raised by pressure of the foot on the long lever, which hides the back foot in the cut. This operation requires very little effort, and occupies but eight seconds, and is only equivalent to stepping up eight steps. To lower the chair one has only, with the toe of his boot, to raise the lever just back of that first named, and the chair sinks rapidly and noiselessly until the lever is dropped, when it instantly stops. Except when in use the long lever folds in under the chair.

A touch of the lever in front of that just named, leaves the chair free to rotate through the whole circle. Directly beneath the seat of the chair, and close to the seat, is shown a lever, which, when pressed forward, permits the rocking movement while the lever is held, but whenever released fastens the chair in position.

Thus the three principal movements, elevation, rocking and rotation, are accomplished. The minor movements, all of great importance, however, are the raising or lowering of the back of the chair; the raising in like manner of the head-rest; the slight rocking of the seat of the chair, so as to prevent the patient from sliding forward; the adjustment of the footstool at various lengths and heights; the spring back support to rest the small of the back. This, at will, is converted into a capital child's seat.

An arm-rest is shown at the right of the head-rest. It can be secured on either side of the head-rest at will.

The whole chair is of the most substantial construction and highly ornamental. It will be upholstered in either green or garnet plush or in leather.

This is *not* an hydraulic chair. It has *no pump*, but is raised simply and solely by a lever actuated by the foot. When raised, the elevation of the central column, which supports the chair, tends to produce a vacuum in the chamber through which it passes, and this chamber is immediately filled by a column of oil, which, opening a valve at the bottom of the chamber and directly following up the central column of the chair, blocks it up whenever the lever ceases to raise it higher. Of course, whenever the same valve is tripped, the oil flows back into its receptacle, and the chair is rapidly and noiselessly lowered. *Not one drop of oil* has ever or can ever find egress from the inner base of the chair to its exterior. So much to silence constant misrepresentations of another dealer.

ADVANTAGES.

1st. It can be raised with the foot of the operator, and by a very slight effort.

2d. It can be raised in half the time of any other dental chair, except the Morrison.

3d. It can be lowered without exertion of force, and as much or as little, or as fast or as slow, as desired, by merely opening a valve.

4th. Its range of movement is superior.

5th. It has a perfect forward and backward movement, so that the patient can be rapidly inclined at any angle by a very slight exertion of force by the hand.

6th. Its arrangement for children is unique and excellent.

7th. Its footstool is readily adapted to the wants of large or small persons.

8th. Its head-rest is completely firm in any position in which it may be placed, has a large range, and is fastened by a single movement of the hand.

9th. The operator can control all its movements without once taking his hand from the mouth of the patient.

10th. It has a perfect rotary movement.

11th. By means of an adjustable foot it will stand firmly on any floor, however uneven.

We have orders for a large number, and are receiving more daily, and entering them in rotation.

JOHNSTON BROS., 1260 Broadway, N. Y.

JOHNSTON BROTHERS & SELBY, 23 N. Charles Street, Baltimore, Md.

The Morrison Dental Chair.

Comfort for both Operator and Patient, Rapid Movement, Simplicity of Construction, Great Durability.

The desirable features of a dental chair are almost completely enumerated above. The Morrison Chair answers each of these requirements more completely than any other chair made.

It contributes to the ease of the operator:

1st. By the lightness and rapidity with which the patient is raised or lowered to a convenient position.

2nd. By the form of its back, which is so narrow as to render it unnecessary for the operator to stretch to reach his patient.

3d. By permitting him to drop either arm of the chair entirely out of his way.

4th. By making it possible to operate in either a standing or sitting posture with equal facility.

It affords comfort to the patient:

1st. In the arrangement by which the lower back-pad may be moved forward to support the small of the patient's back.

2nd. The upper back-pad is readily raised or lowered, so as to exactly adapt itself to the wishes of any patient as if the chair had been made for this one person.

3d. By the readiness with which the patient may change the foot-stool from one position to another as suits their notion at the moment, and without disturbing the operator.

If desired this chair can be furnished with either the usual upholstery of dental chairs, or with Turkish upholstery—soft and with springs; or with summer seats and back—of cane; or with separate sets of all of these, which can be changed from season to season by the owner without difficulty or the necessity of employing mechanics of any kind.

Its movements are very rapid.

It can be raised from its lowest position, in which the seat is 15 inches from the floor, to its highest, 42 inches above the floor, in seven seconds. Both low

and high based chairs are here combined in one, giving a vertical range of more than two feet.

It has no equal in operations upon Children.

The child can be raised as high as needed by the tallest operator.

It is provided with a comfortable back and head-rest, exactly as is a grown person.

The foot-stool is quickly adapted to children of any size.

It is extremely simple.

The principal movements of the chair and head-rest are all under control of but three clamps, and the chair is adjusted in height by a single crank.

By one of the above-mentioned clamps it is securely fastened at any desired inclination, and all done in an instant.

It is very durable, because

1. Being made almost entirely of metal, open joints or season cracks are impossible.

2. The upholstery of this chair is so arranged that it can be renewed, by exchange of the upholstered parts, without leaving the rooms of the operator and at moderate expense.

ACCESSORIES.

CASTORS.—To secure the *rotary movement* for such persons as desire it, legs have been cast, having recesses in the feet, into which Castors are inserted. The castors in the front legs roll laterally only, so that by them the patient's face may be turned to the light. When in the right position a locking device permits you to fasten the castors so that they cannot be moved until unlocked. The castors in the back feet are so placed as to revolve only back and forward, so that while they permit you to easily roll the chair like a wheelbarrow out of position if you wish to sweep, they cannot be moved by the force exerted in plugging a tooth.

NARROW BACK PAD.—To be used sometimes instead of the top pad, and sometimes as a third pad when the back of the chair is stretched to full length.

SPITTOON ATTACHMENT—see in the cut—is a cheap and convenient substitute for a separate spittoon. Is more convenient and costs less.

HEAD-REST.—The Morrison Head-Rest is a *thoroughly* good one, and has given general satisfaction. It is supplied with the chair if we are not otherwise directed, and the price of the chair as named includes this rest. The Johnston Head-Rest is *our latest*, and is everywhere approved. It can be had with the chair at an extra cost of $8.00. It is shown in the cuts.

EXTRA UPHOLSTERY.

Turkish Upholstery.

Some persons having desired a softer style of upholstery than is usual in dental chairs, we have adopted, after many experiments, a modification of what is usually known as the Turkish chair. The seat is made about four inches higher in front than at the back, and both it and the lower back are made very soft by the liberal use of steel springs and hair, the edges being kept full by a piece of heavy spring wire which is built into the upholstery.

The perpendicular edges are covered with a puffing to match, and "set off" with handsome silk cord.

The arms and upper back pads are made heavier than usual, and are puffed and corded to match the seat.

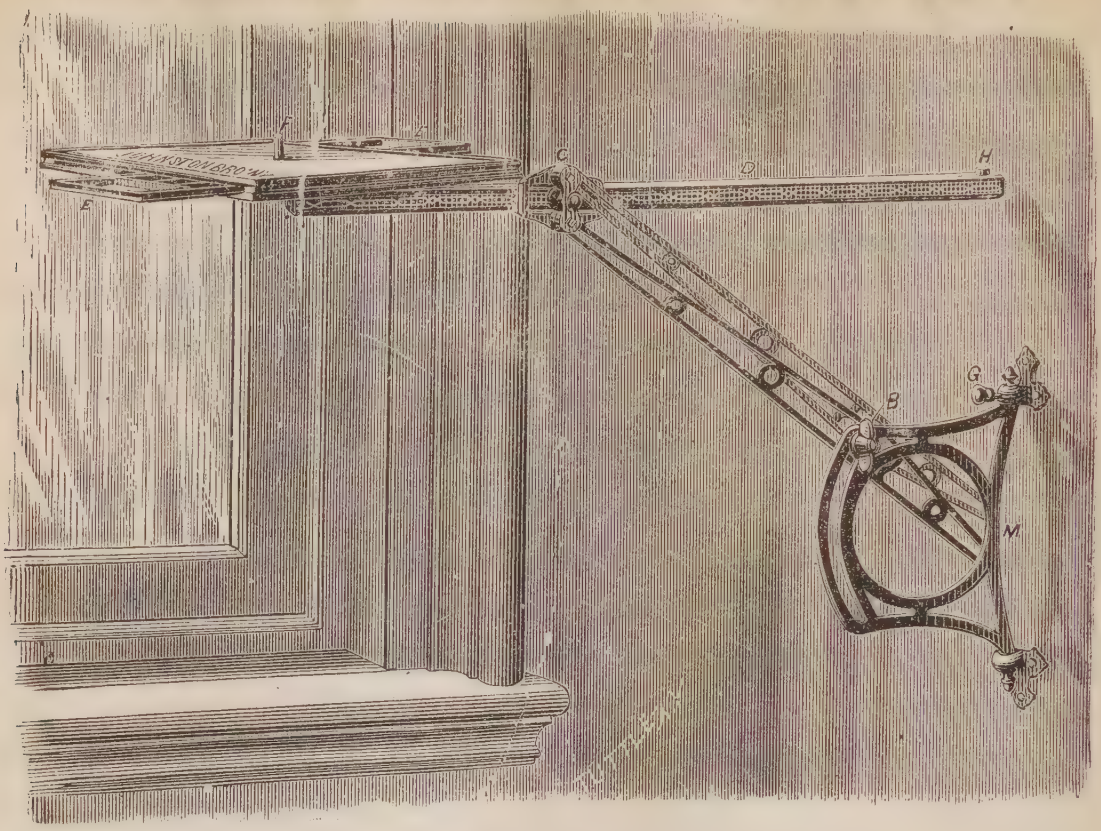
Real Morocco.

We also have produced a very elegant article by the use of real morocco, handsomely embossed. It is durable and particularly desirable for warm climates.

PRICES.

In fine green or garnet plush—with Morrison Head-rest	$ 150.00
Boxing	5.00
To which price add, if ordered:	
With Castors	10.00
With Johnston Head-rest, instead of Morrison	8.00
With extra back-pad	4.50
With spittoon attachment and porcelain cuspador	8.00
With nickled metallic cuspador and gold trap	10.00
With nickled metallic cuspador and gold trap, and nickled spittoon attachment	18.00
With Turkish upholstery	15.00
Real morocco embossed	10.00

MORRISON DENTAL BRACKET.



PRICES.

With Black Walnut Table, 12 inches square.....$25.00.
With Rosewood Table, 14 inches square, and Velvet Top, and Drawers about five-eighth inch deep, lined with Leather..... 40.00.
The Rosewood Table alone, as above, to fit any Morrison Bracket..... 17.00.
Boxing..... .....$1.00.

The cut represents the table in its highest position, and distant from the wall a little more than half the distance it is capable of taking. By loosening the thumb-screw B, and allowing it to rest in the bottom of the slot, (instead of at the top as represented here,) the table will occupy a position as much below M as it now does above the same point. The extreme range, that is, the distance between the table when at its highest and its lowest position, is 24 inches.

M represents a metal frame which is secured to the wall or other support by screws. It swings from side to side as a gate on its hinges. C. M. represent light but strong metallic arms, hinged at M as a centre and moving up or down. At B is a thumb-screw passing through a slot in the frame M. By it the arms can be firmly clamped at any desired height.

At C is a slide-rest through which the hollow rod D passes freely, and may be clamped at any distance from its ends. At one end of this bar a square table is supported, having in it foil and instrument drawers. This table is capable of rotation round F, which is the burner of an alcohol lamp, the alcohol being contained in D and introduced at its further extremity H. Among the advantages of this bracket are these:

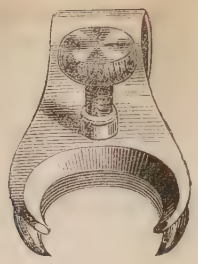
1st. It combines a greater variety of range and movement than any other.
2d. It is rigid in whatever position it is clamped, and will hold 15 lbs. with steadiness.
3d. It provides a clean receptacle for foil and instruments.
4th. It is obvious that a square table is very much more convenient as an instrument stand than a round one.
5th. Its drawers extend through the table and can be opened from either side.
6th. To those having a Morrison Chair it is almost indispensable, as it will follow the chair to either its lowest or its highest position.

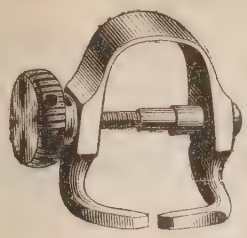
It is handsomely ornamented and nickel-plated throughout, so that it is a very beautiful addition to the furniture of the operating room.

JOHNSTON BROTHERS,
14 Broadway, cor. 32d St., N. Y.

Jarvis' Separators.

(PATENTED SEPT. 8, 1874.)





PRICE REDUCED.

The cuts above shown are full size, and represent an apparatus for separating teeth. It is almost impossible to overstate the value and convenience of the devices. By their use, without delay to the operator or appreciable pain to the patient, adjacent teeth may be forced apart for any of the various purposes for which it has been customary to wedge teeth. Crowded teeth can be readily parted by using the separators, so that rubber dam can be applied without difficulty or loss of time. Two forms are shown by the cuts; of the first form we make three sizes,

No. 1, No. 2, and **No. 3.**

The Separator consists of a piece of steel, nickel-plated, bent upon itself, having the two ends formed to fit the outer portions of the proximate surfaces of two adjoining crowns.

These jaws are forced apart by the action of a screw, which passes through one and against the other of them. This form is applicable to all the bicuspids and molars. It does not touch the gums or injure the teeth, neither does it cause pain sufficient to be of consequence.

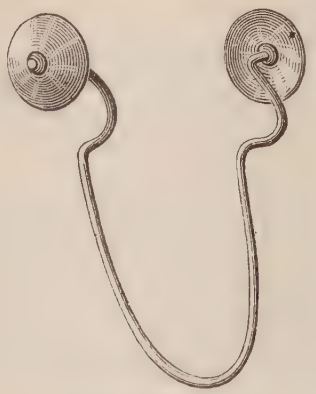
The Compound Wedge, No. 4, consists of two wedges approaching or passsing each other. This is especially applicable to the incisor teeth, and will be found particularly useful in making room for passing rubber dam around crowded teeth. In use, a small strip of wood should be placed over the teeth and beneath the cross-bar, to prevent the points from sliding towards the gum.

PRICES.

Complete Set of Four	$4.00
No. 4	2.00
Nos. 1, 2 or 3, singly	1.00

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.

Elliott's Cheek Distender.



Cut is $\frac{1}{4}$ size.

This convenient device, as its name implies, is designed to distend the cheeks of a patient during operations on the teeth.

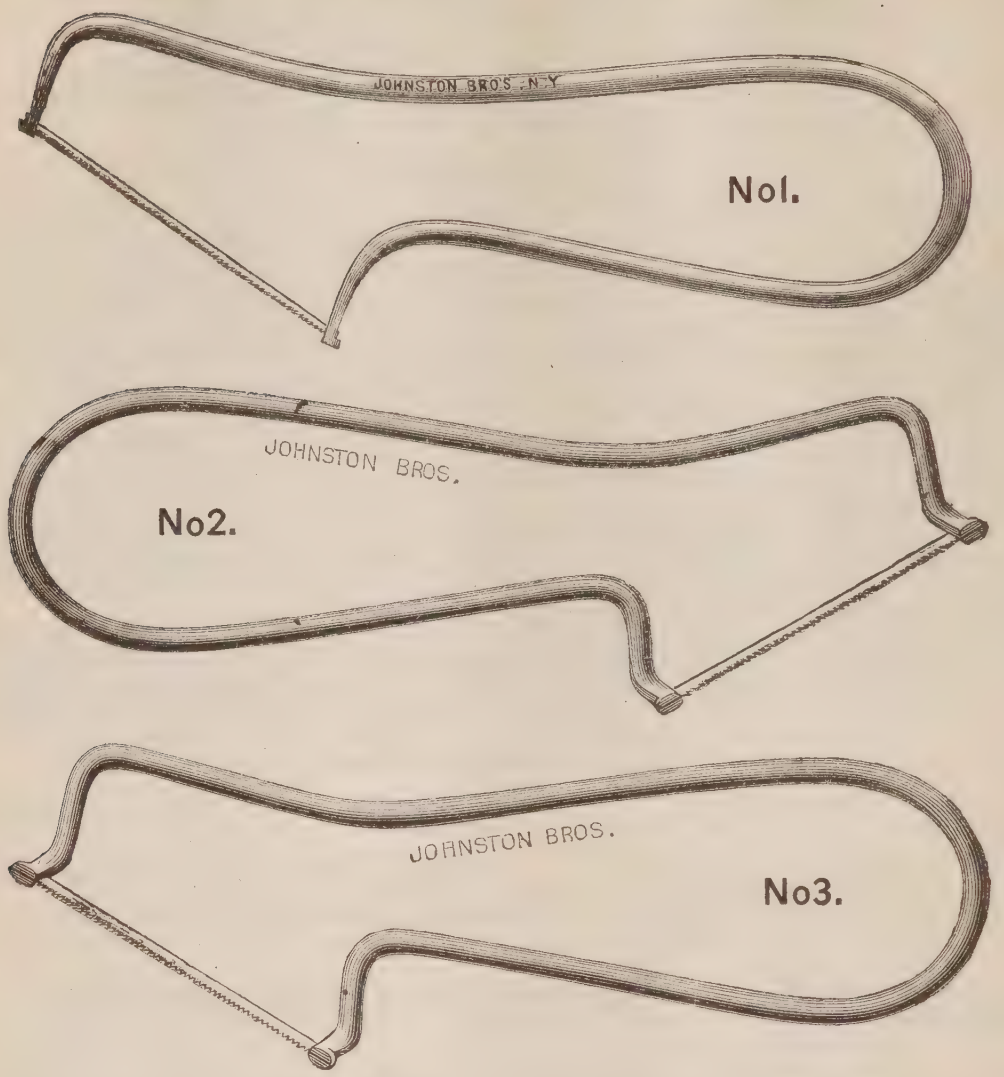
Its bow of spring wire, and the cheek pieces are polished and nickel plated. It serves, in connection with its principal use, to reflect light on the teeth. As the spring is not stiff it is worn with very slight inconvenience. *This is proving extremely popular.* Price $1.00.

JOHNSTON BROS,

15 Broadway, cor. 32d St., N. Y.

CLAPP'S SAW FRAME.

PATENT APPLIED FOR.



In the form shown here this instrument, the device of Dr. Dwight M. Clapp, will be found very useful as a saw frame. The saws are firmly held in place, but can at pleasure be detached or inserted by pressing the wires of the handle together, the thumb being placed just beyond the extremity of the saw, on the handle, for that purpose.

These saws are in many cases superior to files in finishing fillings. Being much thinner than any file, they will pass between teeth, leaving less space (a thing often very desirable, particularly at the cutting edges of the teeth), yet sufficient to be followed by emery cloth or tape.

The saw can often be used between teeth that are crowded, where a file cannot. The saw being flexible—hard enough to cut the gold but not the teeth—will follow the space between, although it be quite irregular. It will cut much faster than a file and is less liable to break.

PRICES.

Saw Frame	50 cts.
Saws, per dozen	25 "
Frame and two dozen saws, postage paid	$1 00

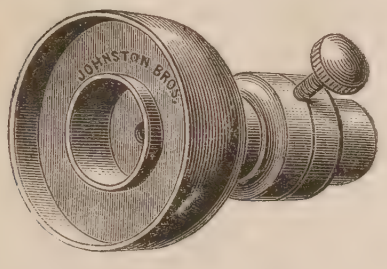
JOHNSTON BROS.,

1260 Broadway, cor. 32d St., N. Y.

SHANNON'S DISK MOUNTER.

THE INVENTION OF DR. W. T. SHANNON.

The SHANNON DISK MOUNTER enables one to do well with the greatest rapidity, what before has been done imperfectly and slowly by such dentists as have essayed the task at all. The directions are simple enough. To mount an "Arthur" or other disk so that it will be perfectly true on its mandrel: Take a screw mandrel or an old bur, warm the end which is to be bedded in the corundum over a spirit lamp, then pass it through the center of the disk; then, while still warm, pass the mandrel into the large end of the mounter, and press the disk on to it, having the face of the disk held firmly against the face of the mounter until it cools, and so is fastened—when it will be found to be true.



Price, - - - - - - - - $1 00

JOHNSTON BROS.

Patent applied for. 1260 BROADWAY, N. Y.

IRIDIUM PLATINA NERVE BROACHES.

They possess the following advantages:

They do not corode in the slightest degree, even when exposed to moisture, acids, iodine, or other medicines.

They can be cleansed perfectly from diseased matter, which gets on them when used to extract dead nerves, or from traces of medicines used in treating diseased teeth, by heating to redness in the flame of a spirit lamp.

Price, per package (½ dozen)..... $1 50

" (¼ " 75

JOHNSTON BROS,

1260 Broadway, N. Y.

SUSPENSION DENTAL ENGINE.

(INVENTED BY DR. W. S. ELLIOTT.)

The Dental Engine represented in the accompanying plate is confidently recommended by us as sure to give general satisfaction.

Two or three years ago a few engines modeled on this, the Elliott, plan (suspension from the ceiling) were sold. Though imperfectly constructed, they have been uniformly commended by those who have used them.

Each of the two styles of Dental Engines which have found favor with the profession has advantages peculiar to itself.

In this form the driving power is belted directly to the shaft of the hand-piece, without the intervention of a flexible joint, and so *entirely avoids all the unsteadiness* or "chattering" which is almost inseparable from the flexible joint, even when short, and is unendurable where the non-rigid portion is long.

The Remodeled Engine, shown in our cut, has not only greater elegance of design than the Suspension Engine as previously sold, but, by its construction, obviates several objections to which the earlier model was liable. It was previously necessary to make the hand-piece large and heavy in order to give tension to the belt, and in furtherance of this purpose a considerable ball of metal was suspended from the rear of the hand-piece. As now made, the ball weight is dispensed with, the hand-piece being balanced and tension given to the driving-belt by placing a small pulley on the hand-piece spindle. The hand-piece is reduced to half its original weight, *and the slightest movement at its point can now be felt by the hand which guides it.* Among its advantages, those subjoined are prominent.

1st. It is more steady in its movement than any Engine made.

2d. Being suspended on a cord, it is free to move in any and every direction—hence the bur can be readily applied to any cavity, whatever may be its position in the mouth.

3d. It has an abundance of power.

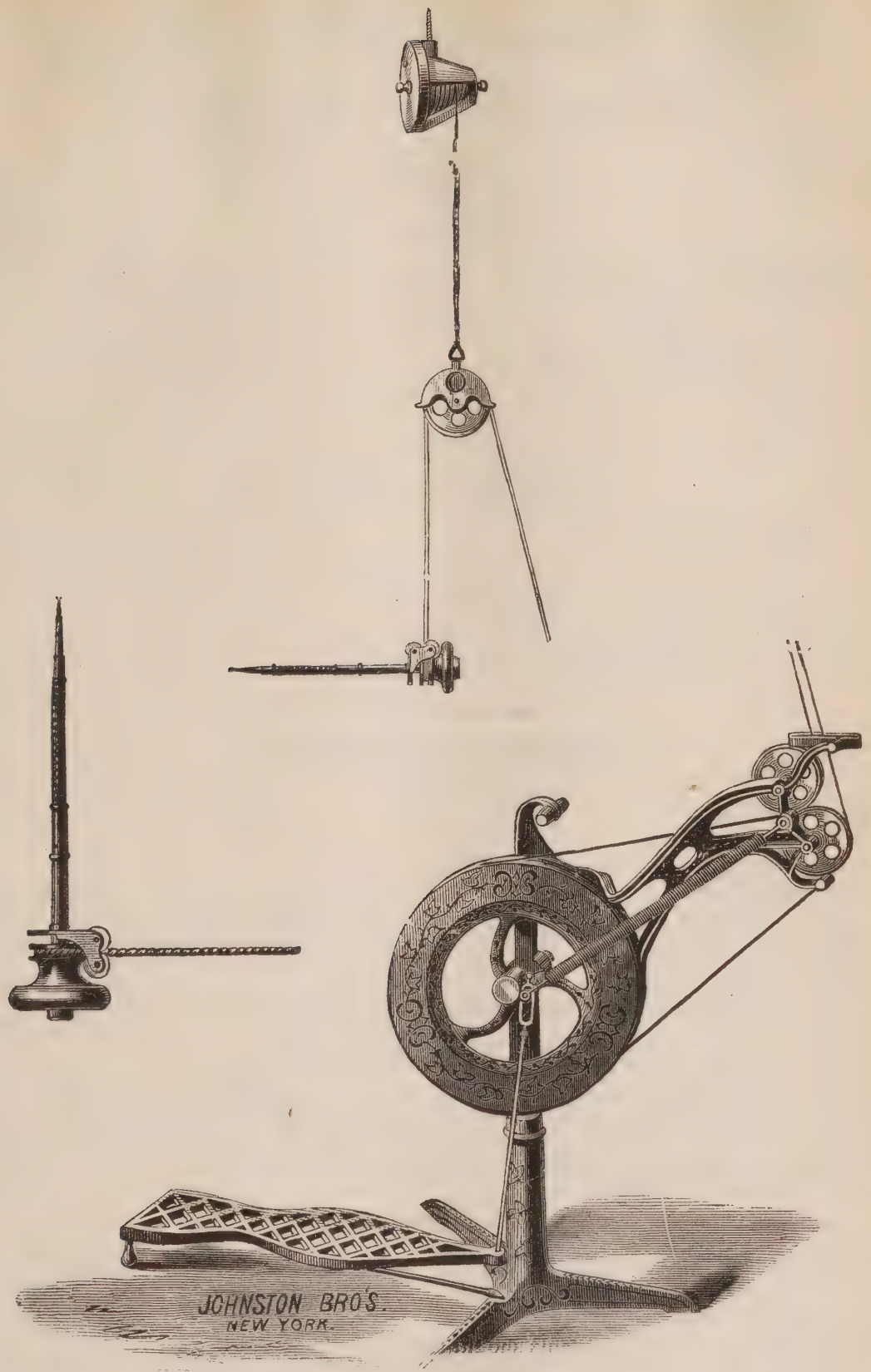
4th. It is not easily broken or likely to need repairs.

5th. It is, above all others, a "*light running*" Engine.

6th. The hand-piece, which formerly was particularly objectionable because of its size and weight, and because of the position occupied by the weight needed to balance it, is now scarcely larger than that of the Morrison Engine, and is fitted to use the same (C style) bur. For the balance-weight we have substituted *a fly-wheel on the shaft which carries the bur.* While keeping the hand-piece well balanced, this gives momentum and greatly increased steadiness to the cutting instrument.

Orders for this Engine will be entered in rotation as received, and promptly filled.

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.



SUSPENSION DENTAL ENGINE.

(Dr. ELLIOTT'S INVENTION.)

Price, $50.00. Right Angle Attachment, $5.00. Boxing, $1.00.

Ohio College of Dental Surgery,

COLLEGE STREET, CINCINNATI.

THE THIRTY-THIRD ANNUAL SESSION—1878-9.

Faculty.

JAMES TAYLOR, M. D., D. D. S.
Principles and Practice, and Dental Hygiene.

WM. CLENDENNIN, M. D.
Anatomy.

J. S. CASSIDY, M. D. D. D. S.
Chemistry and Materia Medica.

J. L. CILLEY, M. D.
Physiology and Histology.

A. O. RAWLS, D. D. S.
Pathology and Therapeutics.

H. A. SMITH, D. D. S,
Clinical Dentistry.

J. R. CLAYTON, D. D. S.
Mechanical Dentistry and Microscopy.

Special Professors:

F. H. REHWINKEL, M. D., D. D. S.
Oral Surgery.

G. W. KEELY, D. D. S.
Cause and Management of Irregularities of the Teeth.

C. I. KEELY, D. D. S.
Demonstrator of Operative Dentistry.

S. WARDELL, D. D. S.
Demonstrator of Carving Teeth.

FRANK BELL, D. D. S.
Demonstrator of Continuous Gum Work.

ALEX BROWN, D. D. S.
Assistant to Chair of Chemistry.

E. G. BETTY, D. D. S., Demonstrator of Anatomy.

Clinical Instructors:

DR. S. B. BROWN,
DR. F. A. HUNTER,
DR. A. W. SMITH,
DR. D. W. CLANCEY,
DR. J. E. CRAVENS,
DR. J. K. JAMISON,
DR. J. I. TAYLOR,
DR. F. PEABODY,
DR C. R. TAFT,
DR A. F. EMMINGER,
DR. W. S. HOW.

This institution being strictly a *Dental College*, the lectures in all the branches taught, Anatomy, Physiology, Pathology, Therapeutics, and Materia Medica included, are arranged with the view to qualify the student to intelligently and successfully practice his profession.

The College Building was designed, erected, and is exclusively used for a Dental School. The lecture and clinical rooms are therefore well adapted for the uses to which they are put.

Terms of Graduation:

A candidate for graduation must be twenty-one years of age. He must have attended two courses of lectures in a Dental or Medical College, the last of which must be in this institution. A reputable dentist in actual practice five years, inclusive of the term of pupilage, may be examined for the degree of D. D. S., after attending one full course of lectures.

Fees:

Matriculation Fee (but once)	$5 00
Professor's Tickets for one session	75 00
Demonstrator's Ticket (for Anatomy)	5 00
Diploma Fee	20 00

It is desirable that the students should matriculate and be in attendance promptly at the beginning of the term. The term begins the 1st of November, and continues sixteen weeks.

Students coming to the city should call on the Dean. Good board can be had for $3.00 to $5.00 per week. For further information, address

H. A. SMITH, DEAN,
286 RACE STREET, CINCINNATI.

New York College of Dentistry.

1878-79.

FACULTY.

FANEUIL D. WEISSE, M. D., Professor of Regional Anatomy and Oral Surgery.

FRANK ABBOTT, M. D., Professor of Operative Dentistry and Dental Therapeutics.

ALEX. W. STEIN, M. D., Professor of Visceral Anatomy, Physiology and Histology.

F. LEROY SATTERLEE, M. D., Ph. D., Professor of Chemistry, Materia Medica and Therapeutics.

J. BOND LITTIG, D. D. S., Professor of Mechanical Dentistry and Dental Metallurgy.

CLINICAL FACULTY.

WILLIAM H. ALLEN, Clinical Professor of Operative Dentistry.

JOHN ALLEN, D. D. S., Clinical Professor of Mechanical Dentistry.

JOHN T. METCALF, Clinical Professor of Operative Dentistry.

WM. T. LAROCHE, D. D. S., Clinical Professor of Operative Dentistry.

BERTRAND J. PERRY, D. D. S., Clinical Professor of Operative Dentistry.

FRANK M. ODELL, D. D. S., M. D., Clinical Professor of Operative Dentistry.

FACULTY LECTURERS.

D. W. WILLIAMSON, D. D. S., Lecturer on Operative Dentistry.

A. RUST CUYLER, D. D. S., Lecturer on Mechanical Dentistry.

C. F. W. BODECKER, D. D. S., Lecturer on Dental Histology.

EBEN M. FLAGG, D. D. S., Lecturer on Mechanical Dentistry.

JOHN SEYMOUR CLARK, M.D., Lecturer on Chemistry, Materia Medica and Therapeutics.

Demonstrators.	*Assistant Demonstrators.*
D. W. WILLIAMSON, D.D.S.	JOHN C. MILLER, D.D.S.
A. RUST CUYLER, D.D.S.	GEORGE J. HARTUNG, D.D.S.
S. FRANK JOHNSON, D.D.S.	JULIUS M. STEBBINS, D.D.S.
GEORDE M. EDDY, D.D.S.	

Students may matriculate at any time, as the Infirmary is open for regular students of the College to practice in the entire year.

The regular course of Lectures will commence on Tuesday, October 1st, and continue until the latter part of February. Three hours of each day of the week (except Saturday) will be devoted to Lectures, and four hours to *Clinics*, and practice at the Chair and in the Laboratory, under the direction of the Demonstrators.

The Infirmary is furnished with twenty-four good chairs and all the appliances. The Lecture-room will seat, and the Laboratory accommodate, two hundred students ; all on one floor, and up one flight of stairs only. There is seldom any lack of patients for students to operate upon.

Tickets for one year's Instruction, including Course of Lectures, Matriculation, Demonstrators', Diploma Fees, and practice in the Infirmary the seven and one-half months between the sessions	$150.00
For the Course of Lectures only	100.00
Matriculation	5.00
Graduation Fees	30.00

Board may be obtained for from $6 to $8 per week.

For further information, address

FRANK ABBOTT, M. D., Dean.

22 West Fortieth Street, New York.

Philadelphia Dental College,

Nos. 108 & 110 N. Tenth St., above Arch.

SIXTEENTH ANNUAL SESSION, '78-'79.

Faculty.

HENRY MORTON, A. M., Ph. D., Emeritus Professor of Chemistry.
C. A. KINGSBURY, M.D., D.D.S., Emeritus Professor of Dental Histology and Operative Surgery.
J. H. McQUILLEN, M.D., D.D.S., Professor of Physiology and Dental Histology.
D. D. SMITH, M.D., D.D.S., Professor of Mechanical Dentistry and Metallurgy.
S. B. HOWELL, M.D., Professor of Chemistry and Materia Medica.
T. C. STELLWAGEN, M.D., D.D.S. Professor of Operative Dentistry and Dental Pathology.
JAS. E. GARRETSON, M.D., D.D.S., Professor of Anatomy and Surgery.
HENRY I. DORR, D.D.S., Adjunct Professor of Practical Dentistry.

F. M. DIXON, Lecturer on Operative Dentistry.
EDWARD L. HEWIT, D.D.S., Demonstrator of Operative Dentistry.
ALONZO BOICE, D.D.S., Demonstrator of Mechanical Dentistry.
ARTHUR R. GAGE, D.D.S., Assistant Demonstrator.
FRANK EYRE, M.D., Ph.D., D.D.S., Demonstrator of Chemistry and Materia Medica.
M. H. CRYER, M.D., D.D.S., Demonstrator of Anatomy.
L. ASHLEY FAUGHT, D.D.S., Demonstrator of Physiology and Dental Histology.

Clinical Instructors.

J. FOSTER FLAGG, D.D.S.
C. A. KINGSBURY, M.D., D.D.S.
WILLIAM C. HEAD, D.D.S.
JAMES McMANUS, D.D.S.
H. C. REGISTER, M.D., D.D.S.
M. H. CRYER, M.D., D.D.S.
C. E. FRANCIS, D.D.S.
WARREN R. MILLARD, D.D.S.
J. L. EISENBREY, D.D.S.
JAMES MARTIN, D.D.S.
W. J. POTTER, D.D.S.
G. B. McDONALD, D.D.S.
GEORGE G. CARDWELL, D.D.S.
JOSEPH P. WYMAN, D.D.S.
J. L. BAKER, D.D.S.

Graduation.—Two years' study, attendance upon two sessions of the *regular winter courses of lectures* and examination at the end of second course are required for graduation. Attendance on one *regular winter course* in any other respectable Dental or Medical College will be regarded as equivalent to one course in the Philadelphia Dental College.

Graduation in Medicine.—Arrangements have been made with the Jefferson Medical College by which the students of the Philadelphia Dental College can obtain the two degrees of D.D.S. and M.D. in *three years.* Students desiring to graduate in medicine must notify the Dean of their intention at the beginning of their second course.

The Dispensary and Laboratory *are open all the year*, and the instruction of the student in *Practical Dentistry* has ever been a prominent feature of the institution; seven hours can be daily spent in actual practice, under the supervision of the *Adjunct Professor of Practical Dentistry, who will give his entire attention during that time to his duties, aided by competent Demonstrators.* The Dispensary consists of two large rooms, each fifty feet in length lighted on all sides by twenty windows and a fine sky-light), furnished with forty comfortable operating-chairs, arranged to command the best light, and affording excellent opportunities for practice to the students. A large number of patients present themselves at the clinics.

The Spring Course of Lectures will commence on the first Monday of April, and continue until the last of June, Fall Preliminary Lectures, commencing Monday, September 2d, will continue daily until October. The Regular Winter Course commences Tuesday, October 1st, and closes on the last day of February ensuing.

Fees.—Tickets for the Course, including the Demonstrators, $100; Matriculation (paid but once), $5; Diploma, $30; Board $4 to $6 per week. For further particulars, address

J. H. McQUILLEN, Dean, 1713 Arch Street.

JOHNSTON ADJUSTABLE FOUNTAIN SPITTOON.

The defects of the Fountain Spittoons hitherto made are, that it is almost impossible to keep them from leaking, and that they occupy a rigid position close to the left of the chair, and hence prevent the operator from working on that side.

These defects will not be found in this spittoon, which is commended to the favor of Dentists by the following points of merit:

1st. It is readily adjustable to the position of the chair; that is, it can by an easy movement of the hand be raised or lowered to suit the height at which the chair is placed at the moment.

2d. The normal position of its base is, say, eighteen inches to the left side of the chair, from which position its basin will ordinarily be inclined towards the chair and patient; but should the operator desire to stand on that side of his patient, the standard of the spittoon can be instantly inclined in the opposite direction, so as to be entirely out of the way

3d. Instead of a wooden case, twelve inches square, is an ornamented metal tube one and a half inches in diameter, which will not warp, occupies very little room.

4th. Movable joints are so arranged that any leakage is impossible, since the waste from the bowl never comes to the joint itself, but is discharged below, in the bottom of the lower half of the socket of the globe, and conveyed into the waste pipes.

5th. It is provided with a gold trap, and an operator of good practice now using the ordinary spittoon will be able to save enough gold in from one to two years to entirely reimburse himself for this purchase.

6th. All its bright parts are of gun metal, and its tubing silk covered.

The water jet used is the device of Dr. Redman, of Louisville, Ky.

Price. $60.00
Boxing. 2.00

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.

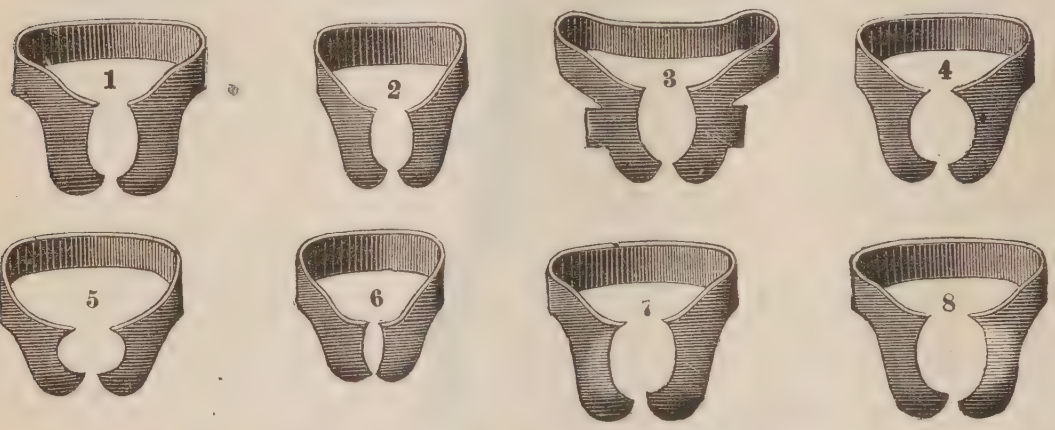
We were never more sure of doing signal service to the Dental Profession than now in offering the

IMPROVED

Rubber Dam Clamps,

INVENTION OF

DR. DELOS PALMER, OF NEW YORK.



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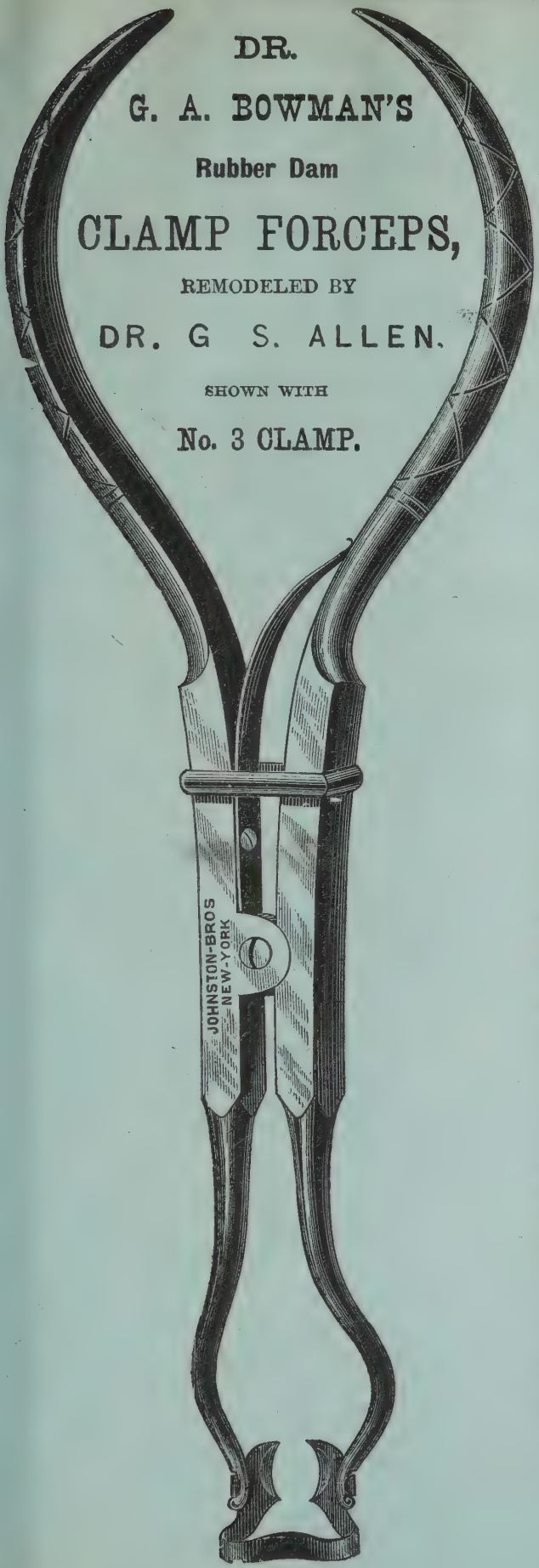

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1878.

JOHNSTONS'

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A MONTHLY JOURNAL

OF

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NOVEMBER, 1878.

NEW YORK:

JOHNSTON BROTHERS,

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1879.

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To those who would keep *au fait* with the movement of the profession in foreign lands—We keep a full file of all dental and of many of the scientific publications of Europe, and nothing of importance fails to be reported to our readers, while the most valuable articles of these foreign journals we republish for our readers, immediately on their appearance.

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Vol. V.——*November, 1878*——No. 59.

THE SALIVARY GLANDS—SOME OF THEIR DISEASES AND TREATMENT—ILLUSTRATIVE CASES EXHIBITED BY WAX MODELS, WITH THE APPARATUS USED IN TREATMENT.

By D. H. Goodwillie, M. D.,
Of New York City.

The principal glands that communicate with and pour their secretion into the mouth are the parotid, submaxillary and sublinqual.

The parotid gland is the largest, and is situated in front and below the ear. It is bound posteriorally by the mastoid process, digastic and steno mastoid muscles, extending somewhat over the latter muscle. The inner surface has two large processes, one behind the mastoid and stynoid process and steno-mastoid muscle, and the other in front of the styloid process, and passes into the glenoid forsa behind the articulation of the lower jaw. It extends above to the zygoma. It is covered externally by the integuments and fascia, and has two lymphatic glands upon its surface. Its excretory duct (called steno) opens upon the inner surface of the cheek, opposite the second molar tooth of the upper jaw.

The submaxillary gland is situated on the inside of angle of the lower jaw, near the internal plerygoid muscle.

The duct (called Wharton's) proceeds from the side of the gland which is turned to the hypo-glossus. It advances between the genio-hyo-glossus, mylo-hoid and sublinqual gland, and opens on the summit of a small papilla at the side of the fraenum of the tongue.

The sublinqual gland is situated under the anterior portion of the tongue, between the geno-glossus and mylo-hyoidus muscle.

The excretory ducts number from eight to twenty, and open on the projection of the gland on either side of the fraenum of the tongue

In structure these glands consist of numerous lobes, which are made up of smaller lobes and held together by dense aveolar tissue, vessels and ducts. The individual lobes consist of numerous closed vesicles, which open into a common duct. The walls of the vesicles are made up of basement membrane, lined by epithelium, and on its outer surface it is covered by a dense capillary network.

These glands become occasionally the seat of disease by—

1st. Obstructions in the *follicles* and *lobes* of the glands.

2d. Obstructions in the ducts of the glands.

The following case, referred to me by Prof. Wm, H. Thomson, M. D., of the University of New York, will serve to illustrate the first condition :

John W. O'B., aged 24 years, born in this State, and has always enjoyed good health. Some time since had the first inferior right molar filled with amalgam for caries.

Pulpitis followed, with supuration and death of the dental pulp.

From decomposition of the pulp, periostitis was set up, which resulted in necrosis of the alveolar process.

Inflammation of the submaxillary and parotid glands followed, and pus escaped through the ducts of Steno and Wharton into the mouth.

The teeth and the necrosed portion were removed.

The glands continued to give great trouble, particularly the parotid.

The inflammation, which at first appeared confined to the upper part of the parotid, extended to the whole gland, with extensive swelling and pain.

This resulted in an opening below the angle of the jaw, which gave exit to pus, and the discharge had been going on six months before I saw him.

The mouth could only be opened about the one-third of an inch. No discharge of pus from the duct of Steno at this time.

(The wax model I exhibit represents the case on the first day I saw him.)

Treatment.—The patient was put under the anæsthetic influence of nitrous oxide gas, and the sinus opened freely for about an inch. A probe passed up into the gland nearly to the zygoma, and into that portion of the gland behind the ramus. A pad was applied over the region of gland, inside of which plaster of paris was placed to bring equal pressure over the gland. The plaster was renewed from time to time as it became necessary from unequal absorption of the lobes of the gland. Attached to the pad was a slight steel spring that passed over the head and was held in place by a leather band around the head. (See Fig. 1.)

Fig. No. 1.

The apparatus was worn and poultices applied as long as there was any discharge. This case was about four months under treatment. The object of this was to bring a *constant gentle elastic pressure* on the glands to cause the vesicles, lobes and ducts to discharge the products of inflammation within their walls, and all such lobes of the gland as have undergone degeneration. It also prevented, to some extent, the flow of blood to the gland to keep up inflammation. And lastly, decreased the secretion of saliva in any normal lobes, and thus prevented any irritation that might be produced by its pressure.

(Wax model exhibited showing case after treatment.)

This elastic pressure treatment can only be applied to glands whose

ducts or false passages are unobstructed to allow degenerated tissue to pass freely out.

This paroted gland has lost a good portion of its lobes as may be known by the following experiments. Both openings of the ducts of steno were exposed and a tube inserted into the duct. The gustatory nerve was now irritated by a solution of chloride of sodium placed on the tongue by means of a syringe. The gland began immediately to secrete saliva and for the space of one minute the flow from the healthy gland was so great that the drops could not be counted. While on the opposite side only about twenty drops passed out during this same time. It took double the time on the disabled side to prepare a cracker into a bolus and to swallow it that it did on the opposite or well side. The external surface over the region of the gland is rather more flat than the opposite side. The mouth can now be well opened. There is quite a cicatrix from the loss of tissue by the long discharge, but I propose to dissect it out and close again by sutures.

The following cases will illustrate the *Obstructions in the Ducts of the Glands :*

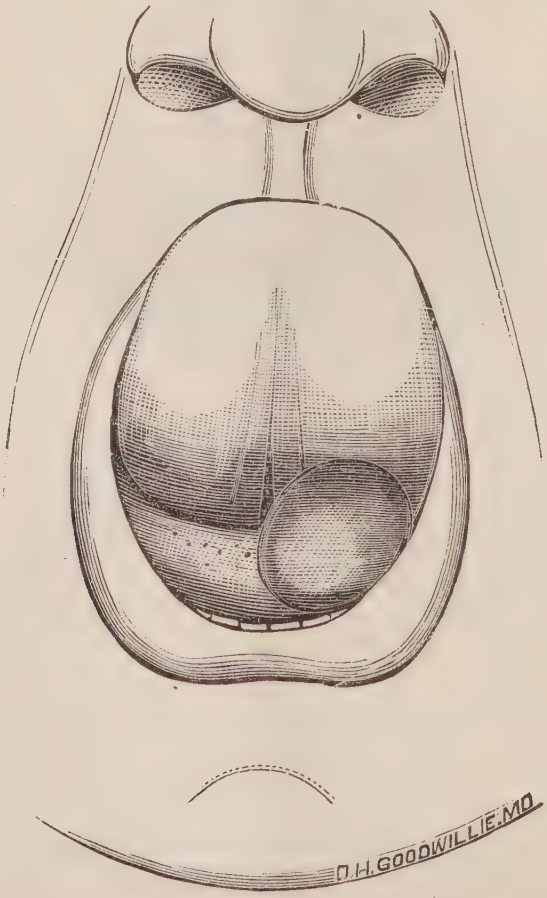


Fig. II. Exhibits the case of a lady who had a distention of a duct of

the sublingual gland by its own secretion. The orifice had become closed by some means and the duct was distended to the size of a chestnut and gave some pain from pressure on the surrounding parts. I passed a silk suture through it inclosing about one quarter of an inch of tissue, tied the ends of the suture together and left it to slough out. By this means the pent up secretion escaped and the opening of the duct again secured.

Another case, similar in position and size to the above, but the distention was caused by a calculus This was removed by an incision over the top of the tumor sufficient to let free the stone. The sublingual ducts are more liable to be stopped by calcerious deposits than are the other glands in my observation.

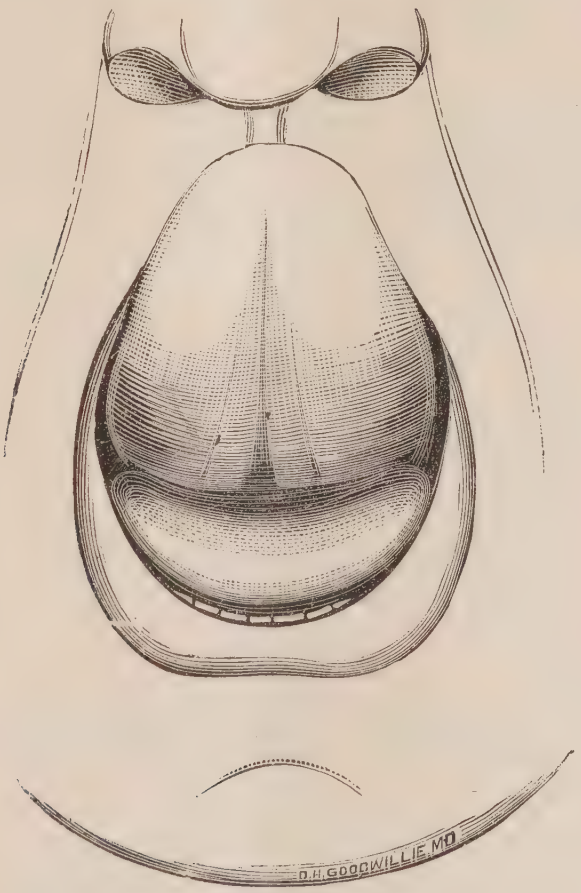


FIG. III.—Represents a case in which the lobes and ducts of the sublingual gland were so distended that it was about the size of the anterior part of the tongue. There was very little external enlargement but the internal one was inconvenient for the patient as it became painful to close the mouth and seriously interfered with mastication and deglu-

tition. This proved to be a sebatious cyst analagous to those met with in the skin; the contents was made up largely of epithelium, cholesterine and fats. A bistory was passed into each side of the tumor and the contents evacuated and washed out with carbolized water and a seton passed. Occasionally the lobes are very much distended by these obstructions in their ducts, and even after the obstructions has been removed they do not return to their normal condition. In such cases there is external enlargement. The gentle elastic pressure treatment is proper in such cases. Salivation occasionally produces a lack of tonisity in the lobes of these glands. Long continued facial neuralgia from some local lesion outside of the gland may extend to the glands. When this occurs it is of serious import, as there is probably some pathological change in the nerve structure. The treatment is the removal of the cause—rest and external support with friction over the gland affected with electricity.

Very often a superating tooth pulp finds it way more often to the sublinqual and submaxillary glands. The removal of the disease pulp or the tooth (provided there is no necrosis of the alveolar process) will produce, with proper treatment, a cure.

160 West 34th Street.

AMERICAN DENTAL ASSOCIATION.

Eighteenth Annual Session—Second Day

EVENING SESSION.

Wednesday evening's session of the Dental Association opened at the appointed hour, and after the reading and approving of the minutes of the morning meeting, President Rehwinkle called for a report of the Committee on Credentials, and Dr. Shepard gave the names of delegates in attendance since the last report. He also presented several accounts, which were ordered paid.

The discussion of the papers presented on Histology and Microscopy were taken up.

Commenting upon the paper of Dr. Atkinson, Dr. McQuillen said he could not take it for granted that a man had made wonderful discov-

eries unless the specimens were produced. He did not intend to disparage or undervalue the work of the essayist. He urged that microscopical specimens, rather than diagrams, should be presented with such a paper. Some of the discoveries presented as new he thought were brought before the Association at Chicago last year by Dr. Black. He said, "We want more original investigation and not so much of the text books." A man who makes a discovery, like a hen that has laid an egg, goes around cackling about it; and then somebody says here in such and such a book there is a similar case. It is important that a familiar acquaintance with its literature should be had, in pursuing investigation upon a certain object.

Dr. G. V. Black, of Illinois, referring to the paper by Dr. C. W. F. Bödeker, of New York, spoke further of the manner of preparing specimens for the microscope. He did not know that the mode recommended by Dr Bödeker was new, but he was not ready yet to take in all that was said with reference to the preparation of living matter. He reminded the Association that Dr. Carl Heitzmann's theory—incorporated in the paper—is but a theory, and its truth not yet established. Dr. Black believed, as yet, epithelial cells, and thought we should hesitate before pronouncing worthless the work of all previous investigators.

Dr. M. S. Dean, of Illinois, and Dr. W. H. Atkinson continued the discussion, the latter defending the paper he had read (Dr. Bödeker's.)

Dr. McQuillen followed with another emphatic appeal for original investigation, especially with the microscope, but begged that investigators would not start out with any preconceived theories.

This order of business being passed, the report of the Committee on Pathology was called for, and Dr. Atkinson, Chairman of the Committee, read a strictly scientific paper, which was subsequently discussed by himself and Dr. Spalding.

The convention then adjourned until Thursday morning.

THIRD DAY—MORNING SESSION.

Pursuant to adjournment, the Convention was again convened promptly at the appointed hour of ten o'clock.

Reports from the Committee on Dental Education were called for, and Dr. George A. Fredericks presented a report in which he held that the day of private tuition has gone by; that the public and the profession demand a collegiate education in dentistry. It being a specialty, den-

tistry should be taught by specialists in the art in actual practice, and a medical course ought to precede it. There was still room for improvement in the practical teaching in the infirmaries connected with colleges The most important operation in dentistry was filling. Any one who set himself up to perform the operation and was not competent, was, in the estimation of the author, worse than a thief. "A thief only steals filthy lucre; while the dentist incompetent to fill a tooth properly adds abuse to injury, for he not only inflicts unnecessary pain, but steals his patient's time and money with the assurance that the tooth operated upon is put in a condition for future preservation." Dr. Fredericks recommended that the President of the Association be authorized to appoint a committee of one at every place where a dental college is located to report to the Association the advantages possessed by such institution for the practical teaching of the science and art of dentistry.

A second report was next read by Dr. Thomas Fillebrown, of Maine, in which he took the ground that the expediency and wisdom of medical schools including dentistry in their course of instruction, appeared for the reason that more schools and those more widely distributed are needed, so that more inducements and facilities may be offered to young men to obtain a good education. Where a professional school is located there will exist a higher standard of professional excellence. Where a dental school is established there will be superior operators and superior patients. Both dental and medical graduates should pursue the full medical course and receive the degree of M. D. In case a student makes a mistake in entering the practice of dentistry, being not well fitted by natural abilities for it, if medically educated he may correct his error by seeking some other branch of practice. And the contrary was also true. Many a poor doctor with surgical talent, but no opportunity to use it, might become a brilliant dentist. Dentistry, as a specialty of medicine, was perhaps more distinctly a branch of surgery, but in either case distinctly medical. When physicians know as much about dentistry as they should, and when dentists were equally well informed with reference to medicine, all questions about recognition or mutual respect would cease to be raised, and "there would be no sickly sentimentality about claiming fellowship with a profession that disclaims us, for all will be of one family, owning the same *Alma Mater*, and laboring for the same common good—the amelioration of human suffering and the elevation of the human race."

In concluding his report, Dr. Fillebrown offered the following preamble and resolution :

Whereas, Dentistry is a specialty of medicine, and requires, as do other specialties, a thorough medical education as preliminary to its most successful study and practice,

Resolved, That we deem it expedient and for the best interests of the practice of dentistry that existing medical schools so enlarge their curriculum as to include efficient instruction in dentistry, and thus make the requirements for graduation the same for this as for other specialties of medicine.

Dr. J. N. Crouse, of Illinois, read a third report, in which he urged that all the respectable colleges should form an association, and adopt certain regulations in regard to dental education, and that the profession at large would endorse as high a standard as they might see fit to adopt. He urged that there are now too many dental colleges. The State Examing Board should not grant diplomas to those who are merely complying with the law. Dr. Crouse insisted that dentistry must be a specialty of medicine, and this can only be done by the student taking the degree of M. D. in the regular school of medicine and afterwards pursue the studies of his specialty. The dentist, to fulfill his mission in the full sense of the term should be medically educated.

Discussion being in order, Dr. R. Finley Hunt, of Washington, D. C., said the subject was of great importance, but the objection to the proposition of Dr. Fillebrown, presented in his preamble and resolution, was that it put the matter of education outside of the control of the dental profession. It was a mistake to suppose that medical instruction was not given in dental colleges. The success of a dental or medical college lay in the conscientious discharge by the officers of the duties and responsibilities resting upon them, and either institution was bad if not properly conducted. Whether dentistry was a distinct profession or not, was a subject that did not connect itself with dental education. Dr. Hunt gave notice that when the discussion was closed, he should move the reference of Dr. Fillebrown's preamble and resolution to the section on education.

Dr. L. C. Ingersoll, of Iowa, said that in all professions the tendency had been downward instead of upward. In the effort to elevate the dental profession at this time, it seemed to him that the commencement was being made in the center when it should be lower down at the beginning. It was elementary and not medical

education which was wanting in dental education. There was too much made of the question of medical instruction and not enough of that pertaining to the elementary or starting point. There were young men who commenced the study of medicine who, at the same time, would be found incapable of writing three or four lines of good English. Go back to the old proverb, said the speaker, that "mind makes the man." All thought is in language. All that we know is in the medium of language. Insist on good mental acumen, or how will men be able to comprehend the terms in use.

Dr. Taylor, of Ohio, said that when he beheld the interest that was now demonstrated in dental education, it took his mind back to the time when dental education was denied to men. He advocated an extension of the present curriculum of study in the dental colleges. He believed that dental students should pass an examination in anatomy, physiology and pathology equal to that required of medical students. If the extension of dental education had been left to medical men forty years since there would have been no such progress in dental education as is witnessed at the present time. True dental science is true medical science.

Dr. J. Foster Flagg, of Philadelphia, said that Josh Billings, a well known and highly esteemed gentleman, had said "they are sensible people who think as we do," and he therefore esteemed the last speaker as a highly sensible gentleman. He favored a trial of the medical colleges. The dental department of the Harvard University was the first inaugurated, and it was by all means the best; that of the University of Pennsylvania was the last, and it was decidedly the worst.

Dr. John Allen: When my good friend, Dr. Taylor, was speaking, my mind, too, was carried back to the time when we had no dental colleges, no dental journals, no associations, no means of interchange of useful information between each other as we have now, and it does me great good to see our younger men coming forward and dwelling upon these important and intricate points that were not touched upon in those earlier days. It shows that our march is onward and upward. I like the idea very much as dwelt upon by our speakers, that we need a thorough education in these collateral branches. I contend that a thorough medical education is the foundation step for a dental education; but the medical education alone will not qualify the man for dental practice. It is as necessary for medical men to know more of the principles of dentistry as it is for dentists to fully understand medicine. For instance: Not long since a gentleman in New York had some difficulty

with the opthalmic nerve. He called upon an eminent physician, who could not account for it. After repeatedly examining his case, the patient growing worse all the time, the physician said he would give a thousand dollars to know what was the matter with that eye. Finally, the gentleman called upon a dentist with whom he was acquainted, who, upon examination, found that it was the cutting of a wisdom tooth that produced the trouble, and upon the tooth being extracted the difficulty was removed. This is only one case. If you will look at the matter carefully you will see there are many cases in which the dentist, unless he has a thorough medical basis to rest upon, will be likely to fail to diagnose clearly what the difficulty is with the patient. The same is true with our medical men. They will frequently fail in their diagnosis because of their ignorance of dentistry, as in the case just cited. Therefore, to diagnose correctly, all these branches should be understood as thoroughly by the dental as by the medical profession.

Prof. WEATHERBEE, of Boston, desired to add his testimony to the general stock regarding dental education, because it was something which he had taken great pleasure in favoring. After a trial of dental colleges of forty years, some men were desirous of putting the profession out to nurse, and recommended an education in medical colleges. They say it is necessary to success. It was a lie to say this—that was plain talk, but people could understand it. Students of dental colleges did not receive the honors of the institution until they were well up in a knowledge of the several branches which they would pursue in a medical college. Students should first graduate in a university; then study letters, theology and the law, before they pay attention to dentistry. Following this, they should take a three years' course of medicine.

Dr. DARBY, of Philadelphia, of the University of Pennsylvania, waiving anything that had been said of the institution with which he was connected that was not complimentary to it, said for the encouragement of those who recommended a medical education, that a majority of the students at the University had signified their intention to take the three years' course in medicine. Time, he thought, would prove whether the medical education was necessary. The course recommended by Dr. Fillebrown and Dr. Weatherbee would make a man taking them forty or fifty years old before he would be able to do anything; before he had lived more than half his life he would be ready for his grave. Dr. Darby thought a young man should become a graduate in medicine, and then he could practice dentistry if he wished. The hint that the

University of Pennsylvania had been influenced by hope of gain in establishing a dental department is unworthy of consideration. The expenditure of fifty-five thousand dollars for a building suited to the purpose precludes any thought of the kind.

Dr. W. H. Atkinson, of New York, said dentistry was medicine, and he desired to put this forth as a dogmatic aphorism.

Dr. Spaulding, of the Western College of Dental Surgeons, said there was a uniformity of opinion as to whether dentistry was a branch of medicine, and whether a medical education was necessary for a dental education. The question was how far the rule could be applied and enforced. Dental colleges now require a more general education. The average dental graduates to-day was better than of medical graduates The proposition of Dr. Fillebrown would result in the dental profession being swallowed up in medicine, and it would come to be a distinct profession. It was old enough to walk alone, at this time, and then was named of taking steps which would fnse it into the medical profession. There was need of unanimity on the subject, or the results would be very disastrous.

SUNLIGHT AND SOLARIZATION IN HEALTH AND DISEASE.

By E. C. Angell, M. D.

According to Plutarch, when the youthful Alexander visited Diogenes at Corinth, he found the famous cynic tranquilly lying in the sun. The warrior affably saluted the philosopher, and asked if he could do him any service.

"Only stand a little out of my sunshine," replied Diogenes. This incident occurred when this renowned Athenian had reached the age of "three score and ten"—long past the eccentric days of his life in a tub and his daylight lantern searches for an honest man ; and there is good reason to suppose that he really valued the invigorating solar rays more than any boon Alexander could give. Nor was he alone in his devotion to sunshine, for, as we learn from Pliny, it was a common practice in Greece for old men to recruit their energies, both mental and physical,

by exposing themselves naked in the sun—a fact which Hippocrates might have had in mind when he wrote: "Old men are double their age in Winter, and younger in Summer."

Among the Romans, the two Plinys accustomed themselves quite as much to sunshine as did the sensible and shrewd Diogenes. Pliny the elder, a man of acuteness and extraordinary intelligence, would employ his leisure after dinner in Summer lying in the sun. His nephew, the younger Pliny, who relates this fact, had himself, at both his country seats, gardens bordered with thick hedges, where he could walk completely nude, thus immersing his whole body in the solar blaze. In fact, the love of sunshine was a marked feature of old Roman life, the dwellings being generally provided on the roofs or southern walls with balconies or terraces, termed *solaria*, where the occupants. sitting or reclining, could sun themselves at their ease.

This use of light and heat was rather prophylactic than remedial. The theraputic efficacy of sunshine, however, was by no means unknown to the ancients.

Gorræus, as cited in Main's "Expository Lexicon," published in London in 1860, says that *heliosis*, or exposure to the rays of the sun, was a remedy among the ancient physicians for many affections of the body, and he mentions particularly dropsy, inflammation of the kidneys and paralysis.

Hippocrates, in prescribing for a fever with chills, directs that the patient warm himself in the sun. Aurelianus and Celsus also refer incidentally to the advantages of sunshine, the latter recommending, for those of weak digestion, a house "well lighted, having the Winter sun"; and he further observes that for patients of this class, exercise in the sun, if the head can bear it, is better than exercise in the shade. It should be noted also that Celsus warms the same dyspeptics against the "meridian sun," and that both he and Galen comment on the evils that may result from excessive insolation or exposure to the solar rays.

To come to more modern times. In 1815 Jean Francois Canvin presented to the Faculty of Medicine at Paris, of which Dupuytren and Pinel were then members, a thesis on the benfits of isolation.

The effects of sunlight on animal life were also discussed by J. C. Ebermier, E P. Girard. E. Horay and others, prior to 1820.

In 1837 we find Dresig putting forth, at Leipsic, a latin dissertation "entitled "Solicitation; or, the Insolation of the Ancients," and ten years later, at Gottingen, Richter gave the medical word another disser-

tation in the same language on "Insolation; or, the Power of the sun on the Human Body."

Since then curious and interesting experiments and observations have been made by Becklard, Beckquerel, Draper, Edwards, Gardner, Hunt, Landgrebe and others, and yet a learned French authority, in the "Encyclopedic Dictionary of Medical Sciences," in process of publication, speaking of the action of light upon the animal organizm, frankly says: "We do not know, in short, what is the exact effect produced by light. Does it act directly or is its only effect to modify the intensity of certain functions, such as respiration? this is what we do not know."

So much for our solar scientific physiological knowledge or rather ignorance. As to the practical therapeutics of the case, there has been, until very recently, no real seientific advancement since Dr. Jonathan Perreira, of London, completed, in 1848, the revision of his admirable "Elements of Materia Medica and Therapeutics," in which he recognizes both solar light and solar heat among the "physical, but imponderable," remedies. Of solar light he remarks that it acts as a "vivifying and vital stimulus," promoting "development and nutrition," and he further says: "In maladies characterized by imperfect nutrition and sanguification, as scrofula, rickets and anæmia, and in weakly subjects with ædematous limbs, free exposure to solar light is sometimes attended with the happiest results."

As to solar heat, after observing that the ancients were well acquainted with its "salutary influence" on the human system, and frequently made therapeutic use of it, he adds: "Exposure to the solar rays, or, as it is termed, isolation, may be employed as a stimulant to promote circulation and warmth in the old, debilitated and paralytic." "It is also valuable in anæmia and scrofula, and as a restorative after lingering and painful maladies."

It is not necessary to quote further at this point to establish the fact that sunshine has been for upwards of two thousand years a therapeutic agent of acknowledged efficacy and value. Nevertheless, it remains indisputable. incredible as it may seem, that so far as this remedy is concerned, we are still on the threshold as regards both practical and scientific knowledge. The reason of this is not far to seek. In exhibiting the solar ray the medical practitioner deals with an agent of dangerous potency, of unusual elusiveness, and of great complexity. All physicians are more or less familiar with sunburn, and not a few are acquainted with sunstroke, and none need be told that the sunbeam has

power like a swift poison to reach with disastrous effect the very seat of life, as well as to work various minor physical evils. As to elusiveness the quantity and quality of sunshine depends so closely on the season and the passing changes of the weather, that it is a matter of doubt whether, on the average, a solar prescription can in our latitude be satisfactorily filled in nature's great pharmacy during more than four hours out of the twenty-four, or more than four months out of the twelve.

And finally, to appreciate the complexity of the agent in question, we have only to recall the fact that the sunbeam is resolvable into rays of various colors, mysteriously inbodying in different proportions the two great forces of light and heat, and the third subtle form of energy known as actinism, which is essential to the chemical miracles of photography or solar art, and not improbably may yet be found quite as miraculously potent in heliosis or solar therapeutics.

It is one of the current facts of popular knowledge that the sun has been, and not without reason, practically deified by the highpriests of modern science as the god of force, the Hercules of the nineteenth century. As the enthusiast, Tyndall, eloquently writes: "There is not a hammer raised, a wheel turned, or a shot thrown that is not raised, turned, or thrown by the sun." And he might have added: There is not a seed quickened, a plant nourished, or an animal perfected that is not nourished, perfected and vitalized by the sun.

Nevertheless, this system of things is so poised, that like the lightning's flash or the sweep of the tornado, this great power may become a destructive curse, and the seed may shrivel, the plant wither, the animal perish from excess of the very force without which it could not exist With human beings the trouble generally is that the pernicious effects of an excess of solar light and heat are so sedulously avoided that we err in the opposite direction, and it is quite safe to assert that in civilized countries three persons out of every four are suffering more or less from insufficient solarization—which convenient term may be employed to denote the total beneficent action of the sun's rays on the human system.

Heat, whether hygienically or therapeutically considered, is an agent of great efficacy and value; nevertheless the profession at large do not look upon solar heat, individually considered, as particularly worth special attention, for the reason that its chief benefits seem equally derivable from artificial heat, which is generally much more readily obtained, and because it is this element of caloric which is often injurious to the very person most in need of the salutary influence of the sun.

It is, in fact, one of the great problems in solar therapeutics to so regulate the thermic force as to avoid annoyance or injury from its effects upon delicate constitutions, while receiving the full benefit of the luminous, and particularly of the actinic, element in the sunbeams. These elements are of the utmost importance, and, so far as their beneficial effects upon the human organism are concerned, they are practically unobtainable from any artificial source.

It should be observed here that in this discussion I am leaving out of the question entirely the relations of light to the eye as an organ of special sense, and also the use of solar heat by means of burning glasses for cauterization and other processes pertaining to surgery more properly than to therapeutics. The question I wish to press home to the conscientous and intelligent medical practitioner is simply this : Do my patients receive enough of the peculiar vitalizing influence which is lodged in the solar rays, and if not, how can it be most easily and safely administered ?

There is no doubt that many physcians who are quite ready, in theory, to admit that sunshine is a valuable remedy. are, in practice, deterred from resorting to it through apprehension of some of the undesirable and often serious evils which in ordinary life it too often occasions. The annoying cutaneous eruptions or irritations resulting from excessive insolation, the hepatic disorders and geneaal debility caused by prolonged residence under tropical skies, the sudden fatality or lingering blight of sunstroke, all serve to prejudice them against the remedial use of the solar rays. They observe almost daily, during the hot season, various minor disturbances produced by exposure to a blazing sun ; they read, perhaps, in Dr. Wood's monograph on sunstroke of the celerity with which he killed rabits by submitting them in closed boxes to the sun's action ; they find Esquirol and other celebrated alienists tracing causes of insanity directly to insolation ; and they resolve to have as little as possible to do with so dangerous an agent, preferring to view it solely from a pathologic and not at all from a therapeutic point of view. Such a course, however, is very far from wise. As soon shonld the physician think of banishing opium from the *materia medica* because of the deaths for which laudanum is responsible, and the long train of miseries arising from the opium habit. He simply prescribes it with increased care, and taxes his inventive powers in contriving means to secure its benefits and avoid as much as possible its deleterous effects. Precisely

this policy should be pursued with reference to the rays of the sun, and the observer in this direction may inspire himself with the thought that if he or his patient should chance to acquire the "sunshine habit," it will prove as advantageous as the opium habit is destructive."

The therapeutic use of the solar rays practically resolves itself into a question of the exhibition of sunlight in such a way as to eliminate any objectionable excess of heat and light, and to secure as much as possible of the actinic force.

As to the general beneficial effects of sunlight, and the injurious consequences that result from any prolonged deprivation of it, there is abundant testimony, to say nothing of the evidence furnished to every man of experience by personal observation.

Dr. Forbes Winslow, in his suggestive volume on "Light, its Influences on Life and Health," thus summarizes the pathological effects of a marked deprivation of solar light: "It may be enunciated as an indisputable fact that all who live and pursue their calling in situations where the minimum of light is permitted to penetrate, suffer seriously in bodily and mental health. These pathological phenomena are principally observed among those confined in dark mines and collieries, holds of ships, factories, prisons, narrow streets, garrets or cellars. The total exclusion of the sun's beams induces an impoverished state of the blood, muscular debility, dropsical effusion, softening of the bones, nervous excitability, irritability of the heart, loss of appetite, consumption, physical deformity, stunted growth, mental impairment, premature old age. The offspring of those so unhappily trained are often deformed, weak and punny; and are disposed to scrofulous affections."

This is a formidable catalogue of ills, but the facts are confirmed by investigations carefully made as to the health of the miners in Belgium and othes European countries. It was shown thereby, for instance, that in the arrondissement of Chemay, where part of the inhabitants are employed in the fields Ind the rest in the coal mines, the field laborers readily furnish their proper quota of military recruits, while among the miners it is rare to find a man who is not ineligible from army duty through arrested physical development or positive deformity.

It is true that these morbid conditions may be larglely ameliorated or entirely removed by a free and constant exposure to light, especially if the remedy is applied while the sufferer is still young.

Fourcault, in his "General Causes of Chronic Maladies," gives a striking illustration of this in the case of a number of orphan girls suf-

fering from chronic diseases, whose condition was greatly changed for the better by simply doing away with the shade of several large mulberry trees, which had prevented the free exposure of their school-room to the full light of the sun.

In commenting on the inestimable value of sunlight to children, Dr. Winslow says: "It is systematically ignored at the period of life when it is of the highest importance it should be brought to bear upon the purification of the blood and consequent healthy development of organic structures. Children, even at an early age, should not be excluded, particularly during the warm periods of the year, from the genial and charming influences of the sun. Great benefit," he further says, "would accrue from giving children solar air baths—that is, permitting them to lie naked upon the bed or floor, free from the encumbrance of clothes, so that their bodies may be thoroughly brought under the influence of good air and bright sunlight. The childreu of savages, as well as negroes, who are often allowed to run about in the open air, freely exposed to the influence of the light, have finally developed muscular structures, and generally enjoy robust health."

The testimony of Alexander von Humboldt affords additional confirmation of this fact: "Deformities and deviations from healthy physical development are exceedingly rare in certain races of men, especially those who have the skin strongly colored, and who wander about naked under the brilliant light of the tropical regions. These have muscular, fleshy bodies, rounded coutours, and present none of the deformities so frequently observed among the inhabitants of other climates."

No one who has remained long at Constantinople can have failed to observe the strong, ruddy appearance of the *hammals*, or porters, who are also the firemen of the Turkish metropolis. These men wear nothing above the belt during the Summer season, and I have certainly never seen elsewhere so many model athletic forms as are gathered together by an alarm of fire at this gem of the Orient. Much advantage is no doubt derived by our oarsmen from the practice of rowing stripped to the waist, thus exposing a conserable surface of the body to the invigorating action of the sun as well as the wind.

A curious confirmction af the value of light in the development of the growing animal organism was afforded by the experiments of Dr. W. F. Edwards, made something more than fifty years ago in France. He found that the development of frogs' eggs was almost completely prevented by placing them in darkness, and that even a tadpole kept in a

dark place, though it attained an unusual size, did not change its form ; a result since verified by Dr. Hammond, who found that while the transformation was delayed for an indefinitely long time by confinement in darkness, the creature became a frog in a few days when supplied with light,

Among the disadvantages of deficient sunlight may be noted an increased susceptibility to contagious diseases. Sir David Brewster observes that in cholera years it was invariably found that the deaths were more numerous in narrow streets and northern exposures, where the salutary beams of light and actinism had seldom shed their beneficent influences.

In view of the deplorable effects of the deprivation of sunlight upon the normally healthy, the consequences of a like privation in the case of the sick may reasonably be supposed to be very serious. On this point Dr. Hammond says, in his Treatise on Hygiene : " I shall never forget the appearance presented by the sick of a regiment I inspected in Western Virginia. They were crowded into a small room, from which the light was shut out by blinds of India-rubber cloth. Pale and exsanguined, ghost-like looking forms, they seemed to be scarcely mortal. Convalescence was almost impossible, and doubtless many of them died who, had they been subject to the operations of the simplest laws of nature, would have recovered." In the same treatise Dr. Hammond further says : " In chlorosis, scrofula, phthisis and in general every disease characterized by deficiency of vital power, light should not be debarred the patient. In convalescence from almost all diseases it acts, unless too intense or too long continued, as a most healthful stimulus both to the nervous and physical systems. The evil effects of keeping such invalids in obscurity are frequently very decidedly shown, and cannot be too carefully guarded against by the physician. The delirium and weakness which are by no means seldom met with in convalescents kept in darkness, disappear like magic when the rays of the sun are allowed to enter the chamber. I think I have noticed that wounds heal with greater rapidity when the light is allowed to reach them than when they are kept continually covered."

A further illustration of the value of solarization in surgical cases is furnished by a case reported by Dr. Stephen Smith, as treated at Bellevue Hospital : "A young man, suffering from disease of the ankle-joint and of the tarsal bones, was admitted, in the month of June, so enfeebled that was decided that he could not survive amputation. His

symptoms were those of septisemia. The weather was very warm, the patient was very weak and very much emaciated, his skin pale and bathed in cold perspiration, his ankle the seat of profuse suppuration. I directed that his entire body be exposed to the sun each day. He began to improve immediately, the sweating ceased, the skin became bronzed and firm, his general condition changed for the better, and the local disease began to improve. He was soon well enough to have excision of the diseased bones, gained a useful limb, and, I have no doubt, owes his life to insolation."

(*To be Continued.*)

MEETING OF THE FIRST DISTRICT DENTAL SOCIETY.

At a meeting of the First District Dental Society, held on the 5th day of November, 1878, Dr. Wm. H. Allen in the chair.

A paper was read by Dr. C. F. W. Boedecker on "The Distribution of living-matter within the human Dentine and Enamel," which was supplemented by the following discussion :

Dr. Atkinson : Mr. President, I think that this paper ought not to be permitted to pass without a few remarks by way of endorsement and by way of apology for our body as not being sufficiently acquainted with the doctrines extant upon the questions of histology to enable them to really appreciate the importance of such a paper. Questions that have heretofore been inexplicable are rendered explicable and understandable under the guidance of new interpretations.

It is tedious for an individual who is not engaged in the investigations of science to listen to the dry details and subterfuges that all literature had to go through in early times to reduce it to understandable shape, involving such investigations as can only be pursued by the use of instruments that shall multiply to the ultimate bodies that are the ultimates of the tissues to such a degree as to have them infringe upon the retina so as to be possible to the sight.

I speak knowingly on this subject. I speak feelingly on this subject. I know how I have been led through the byways of false interpretations, not from the density of the information, but from the non-knowledge, and from the assumption of knowing when they had no means of knowing.

Thanks to Carl Heitzmann we have the key now that enables us to completely unlock these hidden treasures that have made so many shrewd minds blunder. We now know the significance of many things before unknown. We now know what the peculiar kinds of appearances that have heretofore been named variously by the various observers are and the many attempts of revealing the intimate structure of the fibers of the enamel and the fibers of the dentine, and the fibers of the cement heretofore unsuccessful, are now under late discoveries by Prof. Heitzmann and his pupils meeting with success.

We are enabled to understand definitely, by preparing, through staining and other means that are being taught and brought out, the intimate structure of these hard tissues that have been, as you have heard to-night regarded as solid bodies; as absolutely solid masses of lime-salts. But if you have listened closely to the reading of this paper you will see that they have acknowledged that there was some sort of bond of union between the enamel fibers, the dentinal fibers and the nerve in the pulp.

The human mind when it has assumed to explain a thing, whatever it may be, stumbles again and again upon that assumption even against stronger light, even against the presentation of facts that really reveal the true statement of things.

How could bodies be nourished without any kind of channels capable of conveying nutrition from tissue to tissue, let those who have denied it answer. To me it is clear that the human body is under one autonomy as displayed by the different tissues, so that the enamel itself absolutely is nourished and can decay.

We hope to be able to prove these things clearly and satisfactorily to all. The subject is too profound and too complicated to be settled at once, but I rejoice at what has been presented, and presented before this the First Dental Society of the State of New York. Although it cannot meet with that kind of appreciation that its merits entitle it to, nevertheless I am impressed that there are many members of the Society who do place it in the proper position. Always when we are learning our alphabet we learn slowly and enunciate sometimes very imperfectly. Now, why do I value this paper so highly? Simply because we are about to wipe out misapprehension and arrive at a status where we can say that we do know what the tissues are, and hope to know what the various changes are that we call nerve activities.

I could occupy much time in going over the details of this matter and

showing where the individuals in their investigations came and put their noses to the keyhole and made a sniff or two, and said there was nothing there, when they ought to have found the game just by taking another sniff.

Dr. HEITZMANN: Mr. President and gentlemen, it is said that the French Minister, Tallerand, whenever a crime was committed, used to say, "Look out for the woman," and whenever a blunder has been done in histoloy, I may say we have to look out first for the method applied. We learn from the history that we have just heard, in a short kind of abstract, about the histology of the teeth, that the method applied had a great deal to do with the knowledge. The methods in former times were rather poor, splitting off, breaking off small particles and transporting them under the microscope; and a great deal of talk was the main thing—speculation! Another point we learn from history is that in the histology of teeth, just as well as in any other branch of science, there exist but really few observers, very few thinkers indeed. The majority of those who write upon the subject—who make the books upon it—rarely observe; they merely copy what others have said. You know a celebrated English botanist went one day with his friend, who was a gardener, and his friend showed him a peculiar kind of grass, and asked him, "Now, do you know this grass?" and the botanist said, "What kind of grass is it? No, I don't think I have seen it." and his friend said, "That is queer, that is orchard grass. "Orchard grass! that is just the grass about which I have written my best book," said the botanist. And that is just what occurs in the histology of teeth; one says, and the others copy and never discover the truth. The history of the histology of teeth is highly interesting indeed. It shows how each decade; not each century, but each decade, had its peculiar theories. In the last century even such geniuses as the elder Tomes was full of thoughts, but, owing to the poor methods employed, they resulted in mere speculation. The so-called natural philosophy begins in the third decade of this century, and in the fourth decade we see highly important facts brought to our knowledge, and it is just at that time that the elder Tomes mentions the first tissue, which up to that time was altogether overlooked. If we analyze the knowledge gained since that time we come to the conclusion that the first tissue on which some knowledge had been spread was the dentine. Owing to that man Tomes, we learn something that before was not known at all, namely, that there exists soft fibers within the teeth. I speak of the elder Tomes with the greatest

esteem. He was not only an observer, he was a thinker also. He saw something within the canaliculi which up to that time was only considered as barren fluids. He saw first the fibers, and came to the conclusion that in these fibers is located the capacity of conducting sensations; hence he revolves the question wonderfully whether or not we have any right to call these fibers nerves. His son is behind the father. He denies even that the father ever has suggested to consider these fibers as nerves; but it is the fact that he has, and he was very near the truth, because nowadays we know that the living matter in any ordinary protoplasm and in the dentine, instead of being different, are identical. The tissue about which we next learn is the enamel, although the investigation of enamel has been remarkably little cultivated. Nasmyth, in 1849, if I am not mistaken, speaks of a peculiar membrane holding the enamel prisms together. Since that time all authors have given Nasmyth the honor by calling the uppermost layer around the tooth, or only around the enamel, Nasmyth's layer. From that, and what I have learned from Dr. Boedeker's paper, I find they did not quite understand Nasmyth, and there are very good observers and pretty good thinkers who imagine, even now in our age, that what is called Nasmyth's layer runs all around the tooth. In fact, some authors have called the cementum itself Nasmyth's layer. Nothing was easier than to imagine that the Nasmyth's layer ran all around the tooth, and it is of little consequence whether we call it Nasmyth's, or call it cuticle, as the Germans do. With regard to the minute structure of the enamel, very little was known indeed. Our authors just write, one after another, that the prisms are, as you have seen to-night, closely packed together; that there were no interstices. The interstices are very plain; not only the interstices, but the fibers which they contain. The tissue which was the least known is the third tissue, namely, the cementum. All authors, including our best German histologists (for instance, Wedl), considered the separate lacunae as merely containing some fasis-substance. None of them were aware of the fact that there must be living matter in the cementum, just as well as in the tooth bone. They all saw the complete semblance between the two, but the wrong method was the trouble—dry teeth. Now, what could they have seen in dry teeth? They could have seen nothing but spaces filled with air and dirt and filth. But that the lacunæ really contained fibers has been settled again by Dr. Boedeker, who first studied the net work in the bone, and revealed the lacunar substance when he studied necrosis. Then nothing was easier than to bring both

things in agreement. I do not doubt that this is the work for the future which will make us understand numerous pathological processes which thus far could not have been understood. I hope before long, Dr. Abbott, who has studied especially pathology of necrosis, will publish his paper. I can only say one thing, that it would be utterly impossible to understand the processes of caries in the living teeth until after we have studied and understood the enamel tissues of the teeth.

Dr. LATIMER? May we not get some little assistance in the apprehension of this subject by using a figure in this way: When examing sections of enamel, especially under the microscope, I was reminded of an illustration of this kind. Take, for instance, this floor on which these seats are the cells (as Dr. Atkinson used to call them), and here we set up bags of lime-salts, row after row, and tier upon tier: then keep up a pressure on all sides until they take forms. The floor being the seat and the ceiling the limiting membrane, and this filled with tier after tier of these bags, subject to the pressure of the tiers and of the lateral pressure of the other bags of lime. Now, how can we imagine that that limiting membrane is going to keep out of our way until we can pile up bags there? How is it kept out? Is it kept out by its own elasticity, or how are these cells deposited? Examine the specimen under the microscope, and you find in the cells that the incomplete enamel is coffee colored, and we find that it is softer; we find cases in the mouth of teeth in which growth seems to have been checked by disease, and that coffee color remains, and there is a want of soundness there. Now, by this new light thrown upon it, it seems to me we have a chance to understand how calcification can be completed when it is incomplete. The form even was given, all the cells were there, but they had not obtained their maximum solidity yet. Why? I used to ask, and I think I was told that this plasmic mass contained the lime. Then I asked why it had not reached its solidity; it was simply a fluid, a mucilaginous mass, and I was told there was organization all the way down. In this way now will these bags (accepting the figure again) bring the pabulum or be the means of bringing the pabulum and filling those cells!

Dr. ATKINSON: I want to thank Dr. Latimer for the beautiful figure he has given us, and say a few words as to his limiting membrane and filling up the little sacks containing the lime-salts—whether it is better that that shall be done by concurrence of some sort of power by which

these sacks begin at the bottom. The limit is this substance that has been called Nasmyth's membrane, and the great difficulty that has stood in the way has been that they have not done as Dr. Latimer has, examined sections of jaws where teeth were being developed. In every tooth that is the successor of a temporary tooth there is, beyond the limiting membrane, a cell or house, another room that is made up of a bony structure, so that it is completely shut off from its predecessor, the temporary tooth. Now, can we not understand, by the aid of his suggestion, where the lime-salts do come from?

And now, as to the other question that he asks: the reversal of this action is going on, and the dentinal-cap is being thickened by additions from its periphery towards its center until all the elements that are capable of being fully calcified under enamel, go to their limit by being calcified. And thus we haee primary dentine, and whatever calcification occurs after that takes up a new line of departure; some calcifying solidly, without having dentinal fibrils in them at all, and others leaving a few remnants of uncalcified material that we call dentinal fibrilae.

Dr. Boedecker: The dentine starts by what is known as the membrana--eboris inward toward the pulp: in its embryonal condition it is composed of nothing but indifferent or embryonal elements, and these calcify in the same way as bone or any other connective tissue.

Dr. Atkinson: I feel as if we are tampering with the subject and as if I had just been converted. We will never understand this matter until we have fairly investigated embryological developments which were beautifully referred to by the last speaker. We have three embryonal sheets that are made up of nothing in the world but this indifferent material that the Doctor has spoken of, the embryonal corpusels that originate from what is called plastodoal. Now there are three sets of them. One set called proto-vertebræ that shall be wrought into bone; and then a set of proto-veterbræ that are to be wrought into muscels, and they are called muscle plates; and then there is another set of these same bodies that are wrought into nerve-plates.

DENTAL REGISTRATION LAW IN ENGLAND.

The Dental Journals of England are full of matter pertaining to the above subject—almost to the exclusion of other matter. This is particularly true of the November issue of the *British Journal of Dental*

Science. The subjoined article from the October issue of the same journal will be read with interest here.—Ed.

THE NEW DENTAL ACT IN ITS RELATIONS TO THE LICENSING BODIES AND THE PROFESSION.

The Dentist Act has become the law of the land. Though it may be considered questionable, whether as a whole this Act is a righteous one, whether it is about to confer any boon on the public, whether the status of the profession is likely to be raised by it, whether vested interests are sufficiently protected, yet now that the Bill has become law it is foreign to the intention of the present paper to enter as a partisan the lists of these unpractical discussions.

While, however, the Dentists Act itself shall thus be left without praise or censure in this paper, it will be necessary to allude to several topics which are considered grievances by men of high standing in the Dental profession, and to point out how it is in the power of the various educational establishments to correct entirely, or at least to modify, some of these causes of complaint. These causes of complaint shall therefore be stated, a digression will then be made to discuss some features of the Dental question, and finally such remedies as would appear to be in the hands of the educational institutions, and the respectable members of the Dental profession, will be suggested.

The following are the causes of complaint :

1. That the Bill puts men who have taken all pains to qualify themselves on a level with the empiric and advertising quack.

2. That inasmuch as it excludes from the Dental Register any surgeon who is not at the passing of the Act engaged in the practice of Dentistry, a slight has been put on the surgical profession.

3. That by this clause and others in the Dentists Act, the direct tendency of the Bill is to divorce Dentistry from Surgery.

Passing on to the second division of the subject, the features of the Dental question that claim attention, chiefly refer to the educational factor of that question. Thus the past, present and future facilities for learning Dentistry, the attitude of the schools, British and foreign, and that important agent in educating the man in practice, the professional association or society, will in turn be briefly reviewed.

The oldest method of learning Dentistry and one that up to the present time has been largely adopted, is by apprenticeship. This plan has in certain cases many advantages, but with these are combined so

many glaring defects, that on the whole it would be well this system were entirely abandoned. The future of the pupil depended entirely on the moral character and professional skill of his teacher. The terms of his apprenticeship varied from seven years to as many months or even weeks. The pupil by reason of his tender years may have been forced into a calling for which he had no taste. He was bound to keep the closest secrecy about all he learned, to the great detriment of the public, and indeed of himself, inasmuch as he lost much more than he gained by this exclusiveness. Further, the promising apprentice was often kept back for fear he would get above his work. With defects so numerous and so varied it is strange that in this country no substitute has yet been adopted for private instruction in practical mechanical work.

A great stride in the right direction was made in the year 1841, not in this country indeed, but in America. In that year for the first time Dentistry began to be taught as a liberal profession in Baltimore. From that period on the apprentice system was doomed in that country. Every department of Dentistry began to be taught openly. Dental societies rapidly formed. No longer was the science of Dentistry cramped by the tricks of trade Planted for the first time among the liberal professions, it has developed with the giant strides that have raised the standard of American Dentistry to such a pitch of excellence.

Seeing such a harvest in the American fields, it would have been wise for those who have recently legislated for Dentists to have inquired into the American system of teaching, and not to have accepted without question the opinions of an interested and bigoted clique. And for the better information of our readers we will here quote from "The History of Dental and Oral Science in America" the opinions of the highest authorities in the United States:

"Dentistry is a specialty of medicine, and should be taught as such. That it is a specialty of medicine, is, we believe, the highest claim that has ever been made for it. Men should be qualified for the practice of Dentistry as is the surgeon, aurist, or oculist, upon the broad basis of a general knowledge of medicine." "If we desire to be recognised as specialists of the medical profession we should first make ourselves such. If we desire to occupy the same position as other medical men occupy we should educate ourselves as other medical men are educated." "Besides, I have never known, with a single exception, any one individual to excel greatly in both these departments of our art. It is here, as in Europe, the practice of most of our best educated Dental surgeons

to employ mechanics to do their artificial work, who never see the patients. * * * Therefore, while on the one hand I would persuade our well-educated men to confine their practice chiefly to operations on the living teeth, I would as earnestly dissuade the mechanical Dentists from all attempts at operations in the surgical department."

"In all large cities, or places having the requisite facilities, the question is virtually settled by the employment of specialists for most of what is known as 'artificial work.'"

"There is a general tendency evinced by 'Dental students to devote extra time to the practical departments at the expense of regular lectures,' and that it has required the stringent laws of the institution, and effort on the part of the faculty to counteract this tendency."

"The infirmary and mechanical rooms are so attractive that it requires all the talent of our colleagues, and the stringent regulations of the school, to obtain sufficient consideration for the medical branches. The habit of Dentists, such as Dentists have been, and for the most part yet are, is to under value collateral scientific acquirements and make Dentistry, as far as possible, a 'mechanical art.'"

From these extracts it is evident that the tone of American opinion favors the following propositions:

1. That a great deal more is required of the Dentist than to be a mere mechanic.

2. That Dentistry in its higher departments is a specialty of surgery.

3. That the various operations on the teeth and their contiguous structures are to be considered the higher department of Dentistry; and that these require for their due performance the surgical very much more than the mechanical mind.

4. That the Dental student should be taught to consider his medical studies of more importance than his work in the laboratory.

5. That instruction in open school is much to be preferred to private education.

6. That a Dentist should be surgeon first and Dentist after. In other words that the dental ranks should be filled by recruits from the surgical.

7. That a man having read for and passed a long course of surgical study may be entrusted to know whether he is fitted by his mechanical taste to undertake the specialty of Dentistry; and that Dentists formed from such material are certain as a class to excel in education and skill those Dentists who have, willy-nilly, been forced to adopt the profession very early in life.

8. That from these considerations every encouragement ought to be given to surgeons to embrace this specialty, and full allowance ought to be made in any dental curriculum for medical studies as an ample equivalent for any more special Dental pursuits.

The tone, then, of American opinion is to try and cement the relations between Dentistry and surgery, to do away with secret teaching, and to teach in an open school.

Let us now consider how far the English College of Surgeons has followed this lead, and how far it has adopted these enlightened opinions.

Some eighteen or twenty years after Dental schools were started in America a school was opened in London, and the English College of Surgeons decided to grant a special qualification in Dentistry. The licentiateship in Dentistry, though termed a qualfication by the English College, could not be justly regarded as such by those outside the sphere of influence of that body, for it lacked the vital element of a qualification in that it could not be registered under government, and thus up till the passing of the Dentists Act in 1878, the licentiateship in dentistry has remained unrecognized, excpt by its fond parent, as a qualification at all. At the time of its institution, moreover, there were many of opinion that no Dentist should be recognised by the College unless he took out a surgical diploma, and it certainly was never contemplated that the semi-curriculum through which the Dental student had to pass would ever procure for him any privilege in Dentistry to which the man who had passed the full curriculum would not be entitled. In 1859, in a word, the idea of the College was that Members and Fellows were qualified as far as she could make them, and more than qualified, to undertake Dentistry, but that as there was no chance of the Dental ranks being fully replenished by properly educated men, (for Dentistry, though now by Act of Parliament a profession, was, till the passing of the Dentists Act, a trade open to every quack and charlatan), it would be better in lack of such men to make some concession to Dentists and admit any of them to obtain the "hall mark" of the College on a very limited curriculum. That the Dentists thus semi-educated are an improvement on those who had no education at all, we do not care to question; and if the English College of Surgeons had, until it raised its Dental curriculum to a proper standard, refused to grant its Dental licentiates any privileges at the expense of its Members and Fellows and those of equally advanced corporations it might have earned in the matter of its Dental licence the respect and goodwill of its own members and the medical faculty through-

out the kingdom To such an extent, however, has the English College altered its tactics that it not only gives to its Dental licentiates peculiar privileges of which its Members and Fellows are deprived, but the College throws in the way of its Members and Fellows, and those of every other corporation throughout the kingdom, every difficulty to prevent their getting on equitable terms the special qualification in Dentistry of the English College. Under the specious plea of giving a broad education in Dentistry, there lies a counteracting narrowness, a set of capricious regulations tending to open wider and wider the gap between Dentistry and true Surgery. As this is a most important point it will be well to investigate the facts of the case a little more closely.—R. T. Stack, M. D., Dublin.

GALVANIC ACTION WITHIN THE MOUTH—ITS RELATION TO DENTAL SURGERY.

By Geo. Watt, M. D., D. D. S.

Coming from the medical into the dental profession, I fancied that dentists had paid less attention to chemistry than to other sciences collateral with dental surgery. This fancy had much to do in guiding my own thoughts and efforts in the endeavor to contribute my share toward the advancement of dental science. And whether or not this fancy was founded on fact, I certainly noticed less distinctness of thought, in reference to the chemistry of the mouth, than I found on other subjects. And this was especially true in regard to the chemical results of galvanic action in the mouth. Hoping mainly to aid my immediate classmates in mastering this subject, I made it the theme of an inaugural thesis, when a student in the Ohio College of Dental Surgery. (See "Intrastomatic Galvanism," in Watt's Chemical Essays.)

Within the last few years much thought has been bestowed on this subject, especially by two or three members of the profession. The industry manifested by the brethren referred to is highly commendable, and is, I hope, duly appreciated by us all. With reluctance, let me say, that a closer attention to elementary principles would have saved much labor, and would have guided to more correct conclusions. Finding still a great lack of clear thinking on galvanic action within the mouth, without attempting to criticize any one, I will offer a few spontaneous

thoughts, without reference to authorities and text books, and with but little effort toward systematic instruction, aiming to write just as I would talk to my most familiar personal friends; for what else am I now doing? And if the first person, singular number, should appear too prominent, I hope you will regard egotism as not more assuming than *we*-gotism, and that you will remember, without frequent mention of the fact, that every statement herein is simply "according to my humble opinion."

Then, for galvanic action within the mouth, and its relation to dental surgery.

Galvanism is modified electricity. An apparatus for setting in motion or developing this condition of the electric fluid is called a galvanic battery. Batteries are of two kinds essentially, and each kind is subject to various modifications. One is composed of two perfect conductors of galvanic electricity, and an imperfect one. This is the more common variety. The elements of the other kind are one perfect and two imperfect conductors. This is less common, and as it is, neither by intention or accident, placed within the mouth, it may be dismissed from present consideration. Only the first variety is of practical moment to the dental surgeon, and bearing in mind its constituent elements, remember also that unless the imperfect conductor acts chemically on one of the perfect ones, galvanism is not manifested. If it acts on both, it must act unequally, or no current is established. For illustration of these principles, think of the most common batteries. Zinc and copper are called perfect conductors; while the acidulated water, or saline solution, is an imperfect one. Though the metals differ in conducting power, they are called perfect conductors, as they relate to galvanism. In the zinc and copper battery just referred to the liquid acts on both metals: but as it acts with more energy on the zinc than on the copper, galvanic action is manifested, and the greater the difference in the action on the two plates, other things being equal, the greater is the galvanic manifestation. Hence, if the copper is replaced by a metal which totally resists the action of the fluid, there is a gain in the power of the battery. In Groves', and some other batteries, platinum is used instead of copper.

If the two plates of a battery, say zinc and copper, are placed in the exciting fluid, they assume opposite electric states, when nor in contact with each other, or when not united by a metallic conductor; but there is only static electricity. But when brought in contact, either directly or by an intervening metallic conductor, the electricity is set in motion, and what is known as a galvanic circle is established. Such an electric cur-

rent is a potent agent in chemical decomposition, but it has its limits, to be hereafter noticed.

Decomposition by a galvanic current is called electrolysis. A substance which can be so decomposed is called an electrolyte. A conductor conveying a galvanic current into an electrolyte is called an electrode. In practical chemistry, the electrodes, usually wires, convey the galvanic current into the electrolyte, generally contained in a vessel or reservoir at a greater or less distance from the battery. The preparation of A. J. Watts' crystal gold is a beautiful illustration of this. But nothing analogous to such electrolysis ever occurs within the mouth, and if some of my brethren had duly appreciated this, they would have been saved much labor, with less confusion in their teachings. While decomposition is taking place in the receptacle where the electrodes terminate, to exactly the same degree is the liquid in the battery decomposed, provided that the battery is perfect, for all parts of a galvanic circle equal each other in quantity and power. This electrolysis, or decomposition, and this only, is analogous to that which may and does occur in the mouth. Had this been always borne in mind, the time and trouble of many experiments, which throw no light on this subject, might have been avoided.

It has been intimated that electrolysis has its limits—only liquids can be electrolyzed; but how often do we hear of tooth substance—or dentos, whatever that may be—being dscomposed by electrical currents! Water is readily electrolyzed, but ice, never. And not all liquids are electrolytes. Some, as alcohol, will not conduct galvanic currents at all, and, of course, cannot be decomposed by such currents. And, further, only binary compounds, that is, such compounds as contain but two elements, are decomposed by galvanic currents. Let not this be misunderstood. A liquid may be able to conduct galvanic currents while it holds in solution a number of binary compounds. The current will decompose these in the ratio of their chemical equivalents. For example, in the mouth is found water, chloride of sodium, chloride of potassium, and sometimes ammonia; sulphuretted hydrogen, etc., each containing but two elements, and each, therefore, subject to electrolytic decomposition.

Thus far reference is had to true electrolysis—true galvanic decomposition, but the chemical action of agents thus liberated must not be overlooked. And these secondary actions must not be confounded with electrolysis, as has been far too common, I fear, by

very many of my professional brethren. Very much of the chemical results of galvanic action is due to the affinities of the elements thus set free, which being presented in their nascent state, have the increased energy incident to that condition. If a tooth is in any degree disintegrated or corroded, as a result of galvanic action, the phenomenon is due to this secondary action, and never directly to electrolysis.

I regard the subject as greatly simplified when this is clearly understood. Confusion of thought has resulted from an unprofitable discussion of the direction of the galvanic current in the battery and along the electrodes. By confining our thoughts to the battery alone we gain clearness of view. All galvanic action within the mouth is analogous to what occurs here. To aid the memory, let us examine the action within the ordinary battery. If a strip of pure zinc and another of copper are placed in a liquid composed of sulphuric acid and water, and these strips are allowed to touch each other, or are united by an intervening metallic conductor, something takes place. The oxygen of the water unites with and corrodes the zinc; but when water yields oxygen, a corresponding equivalent of hydrogen is liberated. The gas being but slightly, if at all, soluble in water and unable to unite with either of the metals, escapes in bubbles, but only at the surface of the copper, if the battery is perfect. In the entire list of elements, oxygen and hydrogen are at opposite extremes of the electric scale. Oxygen is always more highly electro-negative than any other element, while hydrogen is more electro-positive than any other. But, as we have seen, oxygen goes to the zinc in the battery, and this because the zinc is positive, or in an electric state opposite to that of the oxygen. And the hydrogen goes to the copper, because it is negative, a state opposite to that of the hydrogen. Hydrogen is probably a metal. Now remember that all the metals take the same direction, when separated from the corrosive elements by electrolysis; and the corrosive, such as chlorine, sulphur, flourine, etc., follow the example of oxygen. This brief statement, retained in the memory, affords a key to almost any supposable case of electrolytic decomposition.

To remember the direction of the positive current in the galvanic circle, we need only recall the fact that the zinc or corroded metal is positive. The current passes from this through the liquid to the copper, or uncorroded metal, along this to the electrode or connecting metal, and back to the zinc. The negative current, equal in power and velocity,

traverses, simultaneously, the opposite direction; and this is the reason that telegrams can be sent in opposite directions at the same time on a single wire.

A singular attempt has been made to apply a knowledge of the direction of the positive current to practical use in filling teeth. I allude to the suggestion that different metals be so arranged, in the same cavity, that a positive electric current will pass from the tooth substance to the filling, as if it were the current striking the tooth that destroys it. An old hunter used to show me how smoothly polished he kept the front sight of his rifle by looking along it. The two propositions are equally sound. But, after all, guiding the positive current from the tooth to the filling, is only guiding the equally powerful negative current from the filling to the tooth.

Circumstances being equal, the quantity of electricity set in motion by a galvanic battery is directly in proportion to the surface excited. A pure zinc plate four inches square will give off sixteen times the quantity afforded by a similar plate an inch square.

Another elementary fact, often ignored, is that the decomposing powers of batteries, other things being equal, vary inversely as the square root of the distances between the plates. When the plates are one inch apart the decomposing power is twice as great as when they are four inches, and four times as great as when they are sixteen. And in like manner, when they are a fourth of an inch apart, the power is double that of one inch, and is increased four-fold when they are but a sixteenth of an inch. An imperceptible distance (apparent contact) is many times less than a sixteenth of an inch, yet the increase of power is governed by the same law. The practical electrician sees daily illustrations of this, on account of the impurities of the zinc of commerce. Small particles of iron are often diffused through the zinc, which, with the latter metal, form an infinitesimal series of minute batteries of wonderful decomposing power, as is manifested by the great abundance of bubbles caused by the escaping hydrogen. This is an illustration of true electrolysis, as good as any known to electro-chemical science. The ultimate elements are separated in accordance with their relative electric properties, each going to the metal whose electric state is the opposite of its own.

Now, suppose we place a plate of impure, commercial zinc, in a liquid containing not only water, but chloride of sodium, sulphuretted hydrogen and ammonia. Here are four binary compounds, liquid, capable of conducting galvanic currents, and acting on the particles of both the zinc

and iron, but with the greater energy on the zinc. The water will be electrolyzed, and it is easy to remember that its oxygen goes to and corrodes the zinc, while its hydrogen goes to the iron, and escapes in gas bubbles, unless it there finds something with which to combine. But the salt is also electrolyzed, its chlorine being a corrodent, follows the oxygen, while the sodium goes to the iron. Sulphur goes with the oxygen—its hydrogen, of course, to the iron.

When we reflect that these corrosive elements are brought to the zinc, in obedience to electric attraction rather than to chemical affinity, we can readily see that their corrosive action need not be, and is not all spent in corroding the zinc. When liberated they are free to obey the laws of affinity. But it is well known that nascent chlorine takes hydrogen from almost any compound containing it. The disinfecting and bleaching properties of chlorine are mainly due to this fact. It will, therefore, take hydrogen from water, forming hydro-chloric acid, and this at the zinc. Ammonia composed of hydrogen and nitrogen, if present, is also electrolyzed; and hydrogen being always electro-positive, of course the nitrogen has to go to the zinc, and as it there, in its nascent state, finds oxygen also nascent, combination takes place, nitric oxyd being first formed, which, in the presence of air and water, is rapidly changed to nitric acid. It is on this principle only that the white variety of dental caries is ever found as a result of galvanic action within the mouth.

It might prove unprofitable to notice all the modes of producing galvanic action within the mouth. If I can say enough to awaken an interest in the subject, and to develop clearness of thought in reference to it among my fellow members, this, to me, laborious effort will reap its full reward.

I fear that a few of my brethren misapprehend sometimes, and suspect the presence of galvanic currents in the mouth when the conditions necessary to their production are not present. For example, some have inferred that gold and platinum, in contact in the mouth, will give such results; but how can this be unless the fluids of the mouth corrode at least one of the metals? which is not likely to take place, unless in highly abnormal conditions. Again, when a cavity is partly filled with tinfoil, and the plug is finished with gold, there is often pain and irritation, on change of temperature, within the mouth. This is usually spoken of as a result of galvanic action, which it can hardly be, unless the plug leaks. The pain is ordinarily due to what, in the text books, is called thermo-

electricity. Also, when two metals are placed in the mouth, and one is corroded by the buccal fluid, if they are not in contact, and if there is no better conductor connecting them than the fluid itself, the metals assume opposite electric states, but no current is established, and decomposition of the fluid does not take place. The condition is that of static electricity. But if the metals touch each other, or both touch the mucous membrane of the mouth, a regular circle is developed, and decomposition occurs in proportion to the quantity of galvanism thus set in motion. A gold plug and any one of base metals may constitute such battery, and let us suppose these plugs are in adjacent teeth, and in contact with each other at a given point, or both in contact with the gum at the necks of the teeth, the binary compounds in the buccal fluid must be decomposed, but how? Water and soluble chlorides are present in all mouths. Then, of water, the oxygen, and of the salts the chlorine, go to the base metal, and the hydrogen of the water, and the metals of the chlorides go to the gold. But we have already seen that nascent chlorine takes hydrogen from compounds containing it, hence, hydrochloric acid must be formed at the base metal. And this is why we so often see the most common variety of dental caries about the margins of the base metal plugs; this decay being always the result of the action of hydrochloric acid.

Rape is a crime unknown in chemistry, and there is no social restriction among the elements demanding that one sex shall do all the courting. Hence, when the hydrogen reaches the gold, it takes chlorine from compounds containing it as promptly as itself is captured by the chlorine at the other side of the battery. But by this combination we have hydrochloric acid again, and this is why we so often find the same variety of decay around the gold filling. At the other side much of the force of the chlorine, as well as of the acid, is spent in corroding the base metals, while neither the hydrogen nor the acid can attack the gold; but all the force of the acid is spent on the tooth; and thus the tooth with the gold plug is, in such cases, more corroded than that with the base metal, which leads some to the conclusion that the base metal is the better filling. A similar arrangement, with the same results, may be made by a gold plate and a base metal plug, as well as by other means which may be omitted from the present discussion.

When a gold plug leaks there is apt to be galvanic action. The organic matter of dentine is a conductor, and in this case represents the corroded or zinc side of the battery. Hydrochloric acid decay occurs in

such cases, when the buccal fluids are normal, but when ammonia is present, we may have white decay co-operative with it, owing to the formation of nitric acid by electrolysis of the ammonia.

The "amalgam question" would be entirely omitted here if faithfulness to science would permit. Its general bearings, of course, lie beyond the range of this paper. Only as amalgams are factors in galvanic action within the mouth will they be noticed, and even in this aspect but briefly.

The word "amalgam" always implies that mercury is one of its constituents. Probably the first one used in filling teeth was composed of silver and mercury. That most extensively used for many years contained tin in addition. This may be taken as a type of the race, without stopping to discuss special formulas. Satan is the devil still, even if clothed in the garb of an angel of light; and the ass brayed when he tried to roar, although covered with the skin of a lion.

Very few will claim, I think, that amalgam plugs are pure alloys, in the same sense that brass is an alloy of zinc and copper. The alloy prepared ready for the mercury is made by commingling or fusing together metals without any reference to their chemical equivalents, and in some cases by using metals which will not combine to form a true alloy. Then the mercury is added by guess work, and its excess is squeezed out till the operator thinks he has squeezed it sufficiently tight, and guesses about enough free mercury has escaped; and, although in amalgamating there is much more oxidation in some cases than in others, he guesses that will make no difference, even if it should change the proportions of his metals, which he guessed were about right at the start; and he guesses he can fill with amalgam, even if he cannot with gold.

The scientific metallurgist will tell you, that while there is something of the alloy in your amalgam, there is, at the same time, much of the mechanical mixture. At best, it is analogous to commercial zinc, as an exciter of galvanic action in a corrosive fluid. Tin has less affinity for oxygen than either silver or mercury. The infinitesimal particles of tin become negative, while the corresponding particles of the other metals are rendered positive. As the distances are imperceptible, the decomposing power is very great in proportion to the surface excited. Thus an amalgam filling has, within itself, all that is necessary to electrolyze the binary compounds of the buccal fluids. It may also act as the positive or corroded side of a battery, when in the proper relation with a

gold plug or plate: but its principal galvanic power is as already described.

But this paper, much too long, must be brought to a close. I hope the hints herein set forth will aid my fellow members to clearness of thought in reference to this important subject. Allow me to say that I have not used, in this paper, the latest chemical nomenclature. I am more familiar with the old. Probably a majority of my fellow members are too. It will thus better accord with my previously written essays should it be published with the proceedings of this meeting. And as technical terms are avoided as far as practicable, I hope my younger brethren, who are more familiar with the new nomenclature, will have but little difficulty in following the thoughts set forth. Allow me also to say that this paper is written for this society at the request of some of its most active and experienced members.—*Missouri Dental Journal.*

NOTES.

Drs. J. H. & D. N. McQUILLEN, of Philadelphia, have removed their office to 1713 Arch street.

SURGEON AND MECHANICAL DENTIST.—The following letter appeared in the correspondence column of the *British Medical Journal:*

"*Surgeon and Dentist.*

"SIR: It may interest 'Physician' to know that a precisely similar case to that mentioned by him in to-day's *Journal* was reported to me a short time ago as occurring in Clerkenwell. I at once instructed our solicitors to write to the person who had assumed the title 'Surgeon and Mechanical Dentist,' to the effect that if the word 'surgeon' were not erased without delay, proceedings would be taken against him under the Medical Act (1858). After consulting a lawyer, the offender obliterated the word 'surgeon,' and has since put in its place the word 'operative,' to which no objection can be taken. If 'Physician' will furnish our solicitors with the particulars, I have no doubt they will induce the pe rson he complains of to conduct his practice under a less misleading title.

"I am, sir, &c.,

"GEORGE BROWN,

"Hon. Sec. Med. Defence Ass'n,

"12 Colebrooke Row, N.

"October 5th, 1878."

INQUEST.—Yesterday Coroner Lawson held an inquest on the body of Mr. John Muir, whose sudden death was reported in yesterday morning's *Herald.* The jury returned the following verdict:

"That the late John Muir came to his death while under the influence of chloroform, administered at his own request, preparatory to a painful operation, in the presence of two physicians, and believe

that after symptoms of death became manifest, all possible means were used to resuscitate the deceased.

Dental Diploma Committee.—The following is a reprint of a form, just issued by the Dental Diploma Committee, to be filled up by candidates who purpose presenting themselves through that committee for examination at the Royal College of Surgeons in Ireland :

Form to be filled up by intending candidates for the Dental Diploma of the Royal College of Surgeons in Ireland :

1. Name and address.
2. Age.
3. How long in practice at above address, or elsewhere ?
4. Whether carrying on any kind of business in connection with or distinct from dental practice.

a. If so, what business.

5. Whether employing advertisements or public notices of any kind in connection with dental practice ?

a. If so, furnish specimens.

b. If not now, how long is it since you did so ?

6. Whether holding any other diploma, license or degree.

a. If so, what are they ?

Please give name and address of some clergyman or minister, or two medical gentlemen, to whom you are personally known, and who could, if applied to, furnish confirmation of the facts stated above.

Signature (full name). Date.

N. B.—A complete and faithful reply to queries 5, *a* and *b*, is of the first importance.

When filled up, this form should be returned either to John O'Duffy, Esq., L.D.S.I., 5, Gardiner Row, Dublin; or Richard Rogers, Esq., L.D.S.I. Cheltenham.

Cornaro Again.—It will astonish most men to find out just how little food, compared with their usual habits, is actually necessary to sustain life at its maximum. A Dr. T. L. Nichols, of Malvern, England, has recently been lecturing in London, and giving the results of experiments upon himself, with a view to determining this important question. During the first week he lived on bread (and its equivalents, wheatmeal, oatmeal, rice, etc.), milk, fruit and vegetables (he ate no flesh meat). His habits of life were regular, his excess being that of overwork. The total weight of ingesta (solid) for the first week was 3 lbs. 9½ oz., being a daily average of 8¾ oz. The second week he ate "Food of Health," milk and fruit; total weight, 4 lbs. 4½ oz., a daily average of 9¾ oz. He reports at the end of the second week that nothing could be better physiologically than the effect of the diet upon him. His digestion was perfect, and the actions of all the various organs was as good as it was possible to desire. During the third week he discontinued milk as unnecessary, and took of solid food 3 lbs. 2 oz., an average of 7 1-7 oz. per day. The fourth week, his food being similar, weighed 3 lbs. 6 oz., a daily average of 8 oz. He now added soups, puddings, eggs, etc., and the fifth week his food weighed 3 lbs. 12½ oz. For the sixth week it weighed 3 lbs. 15 oz., or 9 oz. per day. He had taken this diet without stimulants, and had experienced constant increase of health and strength and power to work, and his weight had remained at about 170 lbs. He concluded his lecture with the following sentiment: "The diet question is at the root of disease. Pure blood can only be made of pure food in proper quantity. Proper attention to diet

would reduce the rate of infant mortality and remove many diseases. If the drink of a nation were pure and free from stimulating qualities, and the food were also pure, the result would be pure health." Truly the amount of food wasted and of energy in the efforts of the system to throw off this waste is something prodigious.—*The Sanitary Journal.*

Dr. J. Milner Fothergill, of London, writes to the *Phila. Med. Times* this remarkable prediction: "The advance of medicine in the direction of therapeutics lies now mainly in American hands—or, perhaps, rather, heads." It has generally been alleged by foreign observers and critics, that, while American surgery and gynecology occupy a proud position, the practice of medicine in this country falls far behind that of the Transatlantic professions. So that the above is somewhat encouraging, and possibly may come true.

Glycerine.—Mikulicz has experimented with this substance and liquid food. It will delay decomposition from 24 to 48 hours, if added to the extent of 2 to 10 per cent., at "ordinary temperature of rooms"; 12 to 15 per cent. causes longer delay, and sceptic organisms are only incompletely developed; 20 per cent. prevents the development of bacteria, and therewith the usual decomposition; 50 to 95 per cent. destroys existing cocco-bacteria, speedily if the temperature his high, slowly if it is low. . . . Septic infection is regarded as a chemical poison which is produced by living bacteria, modifying and devitalizing serious exudations in wounds. As an aseptic dressing, glycerine is competent only in fresh wounds, not after putrefaction has set in.—*Cincinnati Lancet, St. Petersb. Med. Woch.*

Longevity.—Maria P. died in Brooklyn, November 14th, at the unusual age of 110 years, 4 months and 15 days. She was a native of Spain, and came to this country 14 years ago.

The Doctor's Ratio.—In the United States there is one doctor to every 600 persons; in Canada, one to 1,193; in France, one to 1,672: in the Austro-Hungarian Empire, one to 2,500: in the German empire, one to 3,500.

The Pure Rubber Bandage, introduced by Dr. Martin, of Boston Highlands, has proved to be a means of vast relief to many cases of chronic ulcer of the leg and eczema of leg. Dr. M. has written for the *British Med. Journal*, Oct. 26, a detailed account of his plan and the success achieved by it within the year past. He is evidently quite willing to take a contract to empty all the ulcer wards of all the hospitals of the land. Dr. Bulkley contributes to the *Archieves of Dermatology* an article setting forth the value of the bandage in the treatment of eczema.

A Man who Burst.—In the *Vierteljahrsschrift fur Gericht. Med.*, July, Dr. Bremus gives account of a man who litterally burst, split his diaphragm in two and died, from four plates of potato soup, "numerous" cups of tea and milk, followed by a large dose of bicarbonate of soda to aid digestion! His stomach swelled enormously, and tore the diaphragm on the right side, causing immediate death. The case is probably unique.—*Phila. Med. and Surg. Reporter.*

Erratum.—In page 425, ninth line from bottom of page, for "plastodoal," read "blastoderm."

NOTICES.

We need thirty to fifty copies of the January, 1878, No. 49, issue of the *Dental Miscellany*. For clean copies we will allow 25 cents each. Send them in and notify by P. O. card that *you* sent them.

BACK AGAIN.

For six months we have occupied the building next the corner of Broadway and 32d Street, the building recently occupied by us on the corner having been torn down to make room for a new one.

The new building is now up, and our friends will find us comfortably ensconsed in a fine room, on the second floor of the corner building, (No. 1260 Broadway)--with nearly fifty feet front on each street--with entrances on either. The 32d Street entrance will shortly be provided with the latest improved passenger elevator.

We are conveniently reached by the Metropolitan Railroad—elevated—the 33d St. station of which is close by us—time from down town, fifteen minutes—the University Place cars (Broadway road), the Sixth Avenue cars, and the cross-town cars, running from Grand Street, East River, to 42d Street and North River, all pass our door. It is but four blocks from the Fourth Ave. cars, from the Hudson River, the Harlem, and the New York and New Haven R. R. depots) to our store.

To all of the Dental Profession we extend a cordial invitation to call on us, whether needing supplies or not.

JOHNSTON BROS.

1260 BROADWAY, cor. 32d St.

SPECIALTIES.

For full description of each of the specialties mentioned below see previous numbers of *Johnstons' Dental Miscellany.* (Specimen copies free on application.)

LIQUID NITROUS OXIDE.

PURE.

Can be kept in the cylinders for years—indefinitely—without deterioration.

Price of 100 gallon cylinder, $10—filled $16 00
Refilling (express charges paid by us) 6 00
Price of 500 gallon cylinder $22, and 500 gallons of gas 44 50
Refilling (500 gallons gas), freight paid by us 22 50
Price of 1,000 gallon cylinder $36, and 1,000 gallons of gas 81 00
Refilling (1,000 gallons of gas), freight paid by us 45 00

APPARATUS FOR LIQUID NITROUS OXIDE.

1. The Surgeon's Case.

No. 1 (5 gallon bag) price $42. No. 2 (7 gallon bag), price $44

2. The Nickel Plated Gasometer—very ornamental.

Price, with Inhaler and all necessary adjuncts for administering gas, $140 00
Either 100 or 1000 gallon cylinders can be used with each gasometer.

3. The Japanned Gasometer.

Plainer, but otherwise same as above $90 00

4. Tripods—for holding cylinders of Liquid Nitrous Oxide, when one desires to dispense with the morocco case of the Surgeon's Case, or with the gasometer.

Price of Tripod, for 100 gallon cylinder $4 00
Same with filled cylinder, and all needed adjuncts 34 00
Price of Tripod for 1000 gallon cylinder 8 00
Same with 1,000 gallons of gas, and cylinder, and all needed adjuncts, 103 00

5. The Suspension Engine—with Cone Journaled Hand-Piece. The steadiest and most accurate dental engine made.

Price.....$50 00
With Lock-Bur Right Angle.....$55 00

6. The Remodelled Morrison Engine.

Price.....$30 00
With Cone Journaled Hand-Piece..... 35 00
With Lock-Bur Right Angle..... 40 00

7. Johnston's Adjustable Fountain Spittoon.

Can be adjusted to any height of the chair, and moved to and from the patient, giving the operator the opportunity to work on either side of his chair, without annoyance from the spittoon.

Price, handsomely plated.....$60 00

The Dentist's Appointment Book
and Pocket Record,

Printed in Carmine and bound in Morocco, with rubber fastenings and card pocket, $1.25

JOHNSTON BROS.

DENTAL PICTURES:

Pictures on Dental subjects are not very numerous, and will always possess interest to practitioners of dentistry. Having reproduced several copies of ancient paintings and engravings, illustrative of dentistry in other countries and in olden time, as frontispieces for the Dental Miscellany, we have, at the request of friends, also printed them upon plate paper, in suitable form for framing or for preservation in a portfolio.

Those now ready are—

1. Der Zahnarzt—From a Steel Engraving of 1672.
2. The Tooth Drawer—English.
3. The Monkey as a Dentist—From a painting by DeCamps, 1840.
4. Der Zahnbrecker—From a German Plate.
5. Transplantation—1787. By Rowlandson.
6. The Ludicrous Operator. By J. Harris, London, 1768.
7. Primitive Dentistry. Scene in Persia by an eye witness.
8. Fifth Pair of Nerves—not colored. From Tomes' Dental Anatomy.

Price each, by mail, 50 cents.

JOHNSTON BROS.,
Broadway, cor. 32d St., N. Y.

FLOSS SILK.

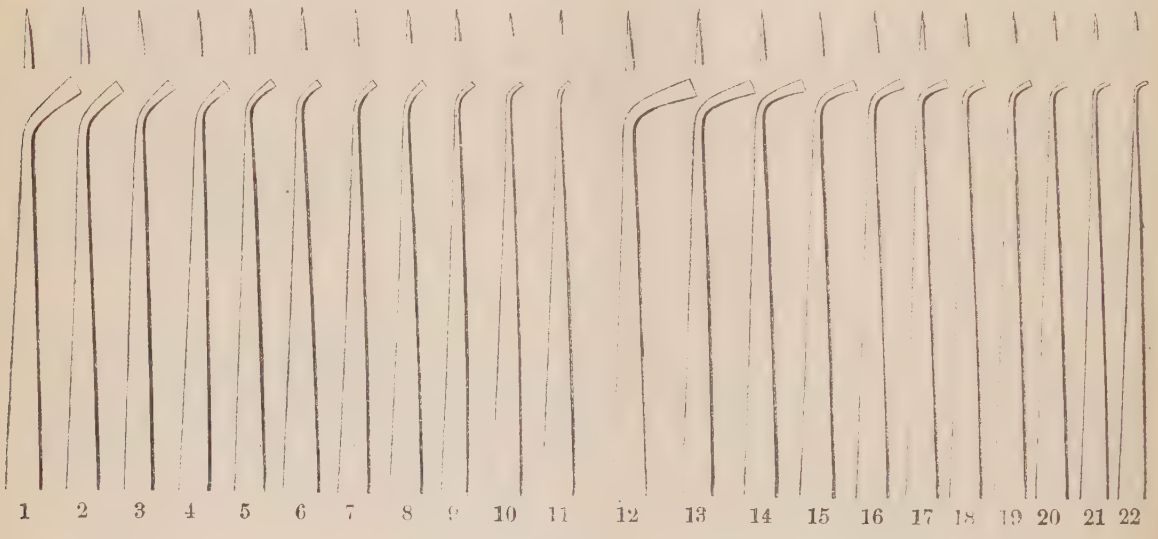
A superior article, per dozen, $1 50.

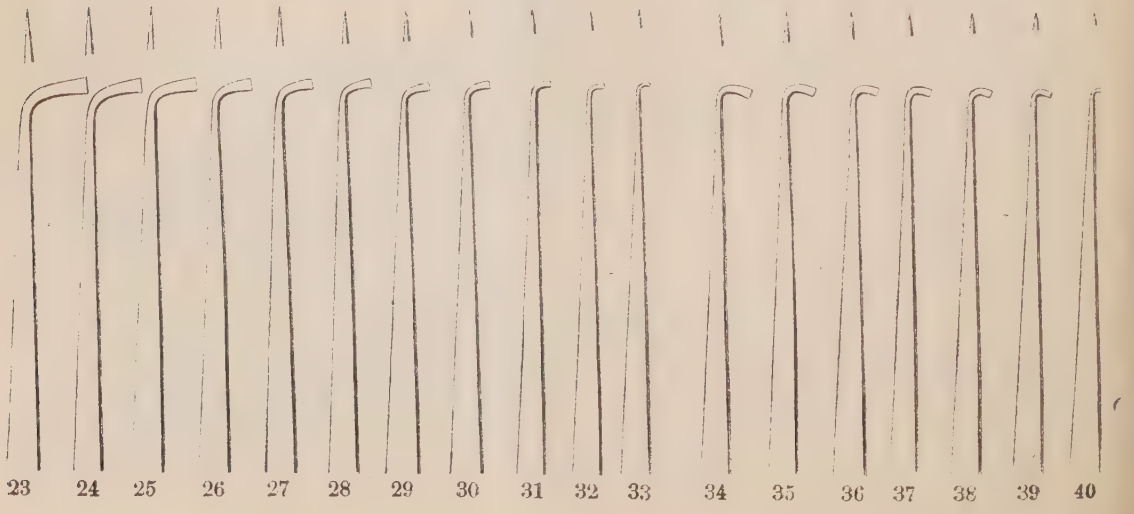
JOHNSTON BROS.,
1260 Broadway.

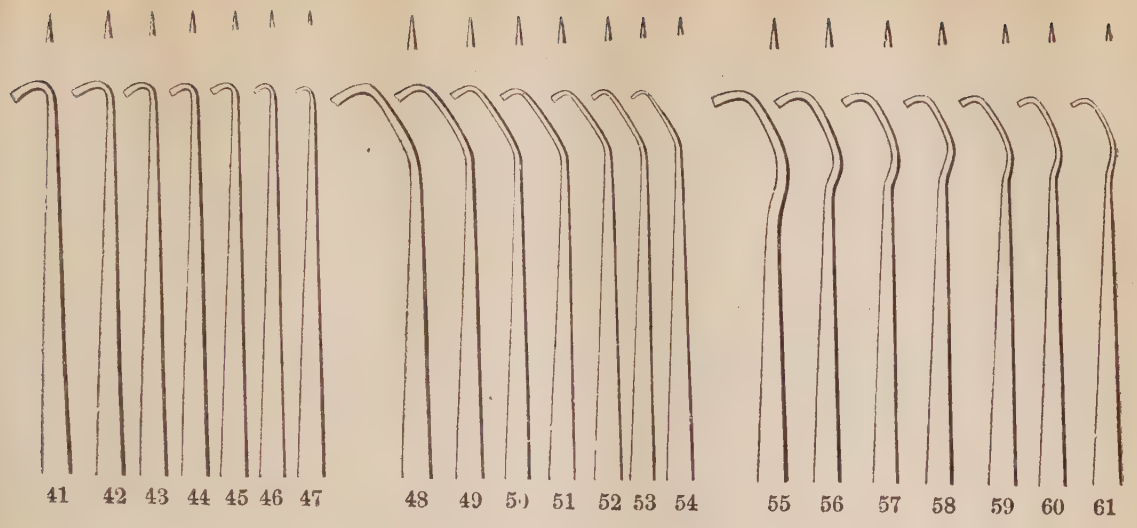
JOHNSTON BROTHERS'

Excavator List.

This list is believed to be, both in number of instruments and range of sizes, by far the most complete yet published. It is not possible to print clearly from cuts as small as the small sizes of excavators made by us. We therefore say that, while the excavators are all made to gauge, and so of uniform size, our cuts of the smaller sizes do not adequately represent them.



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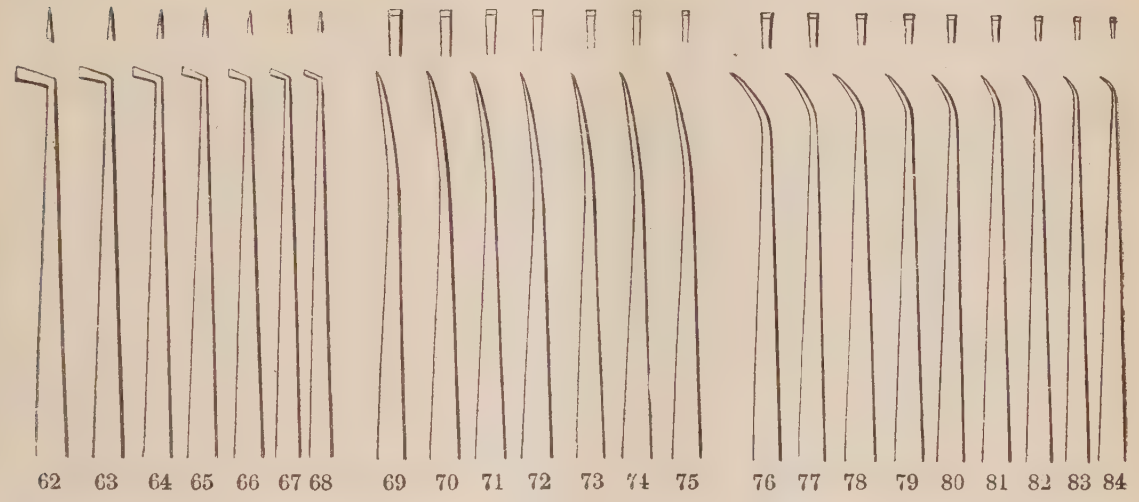
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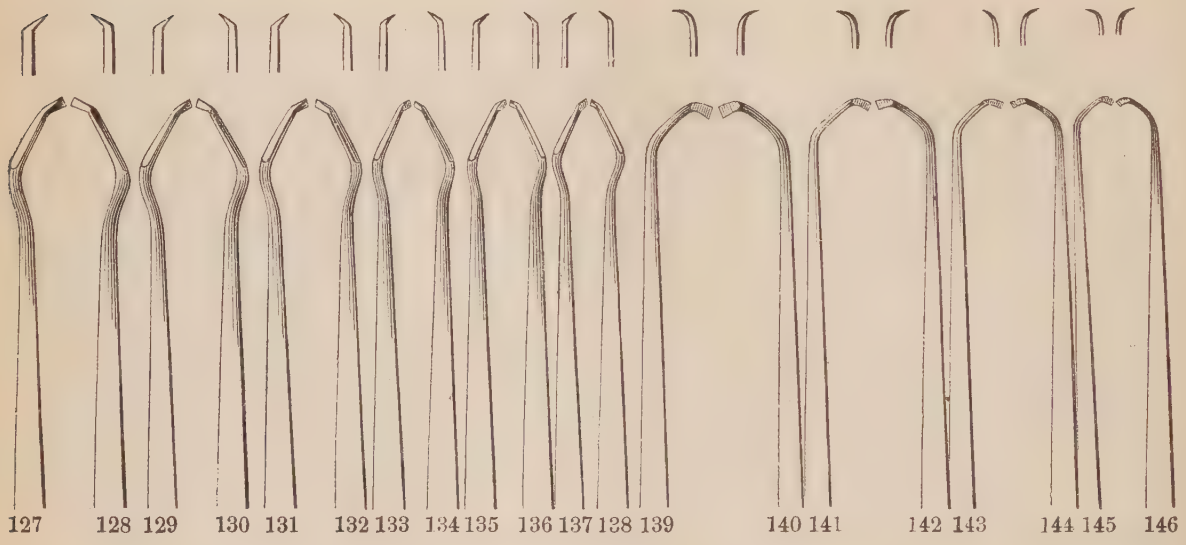
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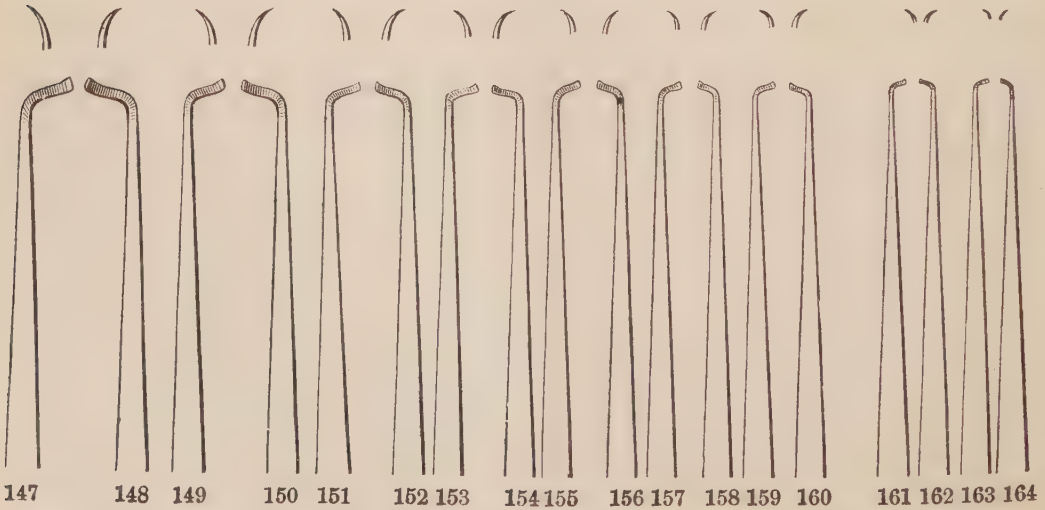
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"Premium" Gutta Percha Stopping.

It will not be disputed that a filling which offers the following properties, is sure of a hearty welcome by both dentist and patient.

"Premium" Gutta Percha Stopping,

1st.—Is thoroughly plastic, but not sticky; in this respect an improvement on previously offered Gutta Percha.

2d.—It is very nearly the color of the tooth.

3d.—It adheres tenaciously to the walls of the cavity, and so protects the tooth from decay. Osteoplastic fillings frequently fail, by disintegration around the margins of the cavity, and admit moisture to the seat of previous decay.

4th.—It does not work "salvy," and by sticking to the *warmed*, (but not *hot*,) instrument by which it is applied, drag itself from the position in which it has just been placed—a common fault with Gutta Percha hitherto.

5th.—It is non-escharotic, and so may be used directly over an exposed nerve, which cannot be safely done with the most used "soft fillings."

6th.—It is a non-conductor of heat, and hence will not transmit thermal changes, from a cold draft of air, or from hot or cold food to the under-lying nerve. In this it is superior to the best metallic fillings.

7th.—It is readily removable by proper instruments, when used as a temporary filling, more readily than either amalgams or cements.

8th.—It can be used in cavities having frail walls, or where the tooth is sensitive, since very little force is required for packing it.

9th.—It hardens promptly.

Although used ordinarily as a temporary filling, instances are numerous where a Gutta Percha filling has lasted ten or twelve years. We think a variety can be made which will have sufficient hardness to make it fit for permanent fillings.

Price, per ounce	$5.00
" " ½ ounce	2.50
" " pennyweight	25

JOHNSTON BROS.,
Broadway, cor. 32d St., N. Y.

Wilkerson Dental Chair.

PATENTED NOV. 20, 1877.

PRICE. $175.

Spittoon Attachment with porcelain Cuspador $6 00
" " metallic Cuspador and gold trap..... 14 00

The cut is a good representation of this unique chair. The acknowledged requirements of a first-class dental chair have been here secured by Dr. M. B. Wilkerson—the inventor—by methods showing great originality. All cranks are dispensed with and levers substituted for them. The chair is raised by pressure of the foot on the long lever, which hides the back foot in the cut. This operation requires very little effort, and occupies but eight seconds, and is only equivalent to stepping up eight steps. To lower the chair one has only, with the toe of his boot, to raise the lever just back of that first named, and the chair sinks rapidly and noiselessly until the lever is dropped, when it instantly stops. Except when in use the long lever folds in under the chair.

A touch of the lever in front of that just named, leaves the chair free to rotate through the whole circle. Directly beneath the seat of the chair, and close to the seat, is shown a lever, which, when pressed forward, permits the rocking movement while the lever is held, but whenever released fastens the chair in position.

Thus the three principal movements, elevation, rocking and rotation, are accomplished. The minor movements, all of great importance, however, are the raising or lowering of the back of the chair; the raising in like manner of the head-rest; the slight rocking of the seat of the chair, so as to prevent the patient from sliding forward; the adjustment of the footstool at various lengths and heights; the spring back support to rest the small of the back. This, at will, is converted into a capital child's seat.

An arm-rest is shown at the right of the head-rest. It can be secured on either side of the head-rest at will.

The whole chair is of the most substantial construction and highly ornamental. It will be upholstered in either green or garnet plush or in leather.

This is *not* an hydraulic chair. It has *no pump*, but is raised simply and solely by a lever actuated by the foot. When raised, the elevation of the central column, which supports the chair, tends to produce a vacuum in the chamber through which it passes, and this chamber is immediately filled by a column of oil, which, opening a valve at the bottom of the chamber and directly following up the central column of the chair, blocks it up whenever the lever ceases to raise it higher. Of course, whenever the same valve is tripped, the oil flows back into its receptacle, and the chair is rapidly and noiselessly lowered. *Not one drop of oil* has ever or can ever find egress from the inner base of the chair to its exterior. So much to silence constant misrepresentations of another dealer.

ADVANTAGES.

1st. It can be raised with the foot of the operator, and by a very slight effort.

2d. It can be raised in half the time of any other dental chair, except the Morrison.

3d. It can be lowered without exertion of force, and as much or as little, or as fast or as slow, as desired, by merely opening a valve.

4th. Its range of movement is superior.

5th. It has a perfect forward and backward movement, so that the patient can be rapidly inclined at any angle by a very slight exertion of force by the hand.

6th. Its arrangement for children is unique and excellent.

7th. Its footstool is readily adapted to the wants of large or small persons.

8th. Its head-rest is completely firm in any position in which it may be placed, has a large range, and is fastened by a single movement of the hand.

9th. The operator can control all its movements without once taking his hand from the mouth of the patient.

10th. It has a perfect rotary movement.

11th. By means of an adjustable foot it will stand firmly on any floor, however uneven.

We have orders for a large number, and are receiving more daily, and entering them in rotation.

JOHNSTON BROS., 1260 Broadway, N. Y.

JOHNSTON BROTHERS & SELBY, 23 N. Charles Street, Baltimore, Md.

COMBINATION WILKERSON CHAIR ATTACHMENTS.

STYLE 1.—As shown in cut, including nickel plated spittoon, with gold trap, and Allan bracket table, also with nickel plated tumbler holder.....$40 00

This table of walnut, handsomely ornamented with French walnut, is fourteen inches square and three inches deep. It has one drawer, fitted for about one gross of engine instruments; two drawers adapted for gold preparations, and two for filling instruments.

STYLE 2.—Same as above, with a porcelain cuspador instead of the nickel plated spittoon..... $32 00

STYLE 3.—Same as style 1, except with Morrison bracket table instead of Allan table..... $32 00

STYLE 4.—Same as style 1, except with Morrison table and porcelain cuspador, instead of Allan table and nickel plated spittoon..... $24 00

STYLE 5.—Same as style 1, less spittoon and fork, and tumbler holder..... $25 00

STYLE 6.—Same as style 1, but with Morrison table instead of Allan table, and less spitton, fork, and tumbler holder..... $17 00

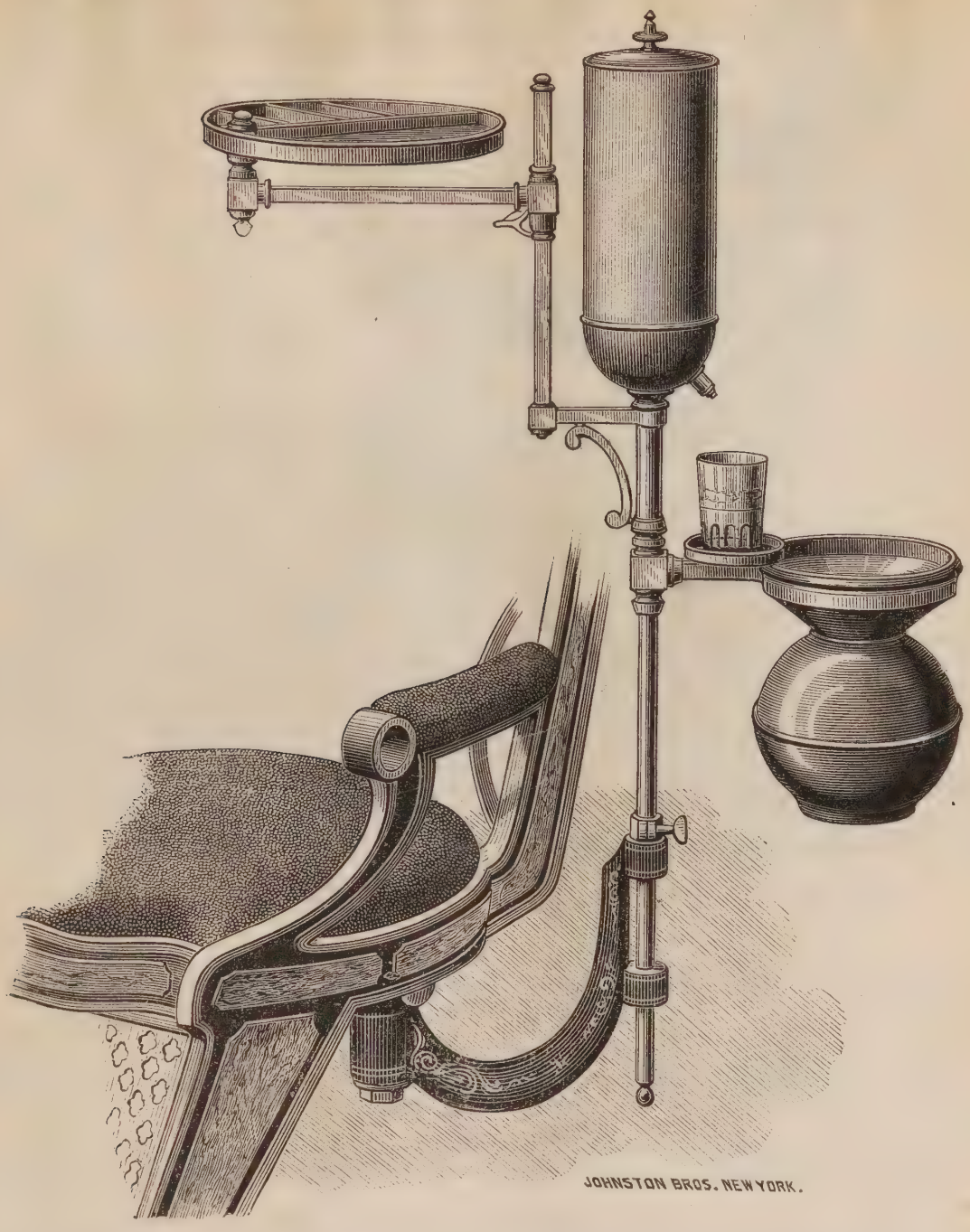
STYLE 7.—Attachment and nickel plated spittoon and glass holder (no bracket) $25 00

STYLE 8.—Same as style 7, except with porcelain cuspador instead of nickel.. $17 00

NOTE.—We can supply a few very fine rosewood bracket tables—Morrison style—fourteen inches square and one inch deep, at four dollars each above the price with Morrison walnut table, or four dollars less than where the Allan table is supplied.

For plain cheap spittoon see Chair advertisement.

WILKERSON RESERVOIR SPITTOON—AND BRACKET.



This attachment to the Wilkinson Dental Chair is designed to satisfy a want long felt by those of the profession who are so situated that a supply of running water is not readily obtained.

By reference to the illustration accompanying this advertisement it will be seen that a Reservoir of water is supported above the Cuspador, upon a nickel plated column, which in turn is held firmly by a japanned arm which swings freely from the side of the chair. It is very strong, and imparts its own steadiness to the whole apparatus. The plated column is adjustable vertically, and can be secured at any height as compared with the chair that may suit the requirements of the operator By simply lifting the rod that projects through the centre of the cap of the Reservoir a valve in the bottom of the Reservoir is opened and a gush of water is permitted to pass to the Cuspador, the funnel of which is so constructed that its whole surface is flushed and rinsed by the water. The capacity of the Reservoir is sufficient to rinse the Cuspador twenty times. The attachment of the Cuspador is such that it is readily removed when it is desirable to empty it. It is provided with a gold trap of the latest and most improved form. A glass and faucet for drawing water from the Reservoir is provided.

The bracket table is so constructed that it can be raised and lowered by one hand, and is so mounted on the post that it can be placed in any position the operator may desire. *The whole attachment is highly finished and handsomely nickel plated.*

Price..... $50 00

JOHNSTON BROS.,

1260 Broadway, N. Y.

The Morrison Dental Chair.

Comfort for both Operator and Patient, Rapid Movement, Simplicity of Construction, Great Durability.

The desirable features of a dental chair are almost completely enumerated above. The Morrison Chair answers each of these requirements more completely than any other chair made.

It contributes to the ease of the operator:

1st. By the lightness and rapidity with which the patient is raised or lowered to a convenient position.

2nd. By the form of its back, which is so narrow as to render it unnecessary for the operator to stretch to reach his patient.

3d. By permitting him to drop either arm of the chair entirely out of his way.

4th. By making it possible to operate in either a standing or sitting posture with equal facility.

It affords comfort to the patient:

1st. In the arrangement by which the lower back-pad may be moved forward to support the small of the patient's back.

2nd. The upper back-pad is readily raised or lowered, so as to exactly adapt itself to the wishes of any patient as if the chair had been made for this one person.

3d. By the readiness with which the patient may change the foot-stool from one position to another as suits their notion at the moment, and without disturbing the operator.

If desired this chair can be furnished with either the usual upholstery of dental chairs, or with Turkish upholstery—soft and with springs; or with summer seats and back—of cane; or with separate sets of all of these, which can be changed from season to season by the owner without difficulty or the necessity of employing mechanics of any kind.

Its movements are very rapid.

It can be raised from its lowest position, in which the seat is 15 inches from the floor, to its highest, 42 inches above the floor, in seven seconds. Both low

and high based chairs are here combined in one, giving a vertical range of more than two feet.

It has no equal in operations upon Children.

The child can be raised as high as needed by the tallest operator.

It is provided with a comfortable back and head-rest, exactly as is a grown person.

The foot-stool is quickly adapted to children of any size.

It is extremely simple.

The principal movements of the chair and head-rest are all under control of but three clamps, and the chair is adjusted in height by a single crank.

By one of the above-mentioned clamps it is securely fastened at any desired inclination, and all done in an instant.

It is very durable, because

1. Being made almost entirely of metal, open joints or season cracks are impossible.

2. The upholstery of this chair is so arranged that it can be renewed, by exchange of the upholstered parts, without leaving the rooms of the operator and at moderate expense.

ACCESSORIES.

CASTORS.—To secure the *rotary movement* for such persons as desire it, legs have been cast, having recesses in the feet, into which Castors are inserted. The castors in the front legs roll laterally only, so that by them the patient's face may be turned to the light. When in the right position a locking device permits you to fasten the castors so that they cannot be moved until unlocked. The castors in the back feet are so placed as to revolve only back and forward, so that while they permit you to easily roll the chair like a wheelbarrow out of position if you wish to sweep, they cannot be moved by the force exerted in plugging a tooth.

NARROW BACK PAD.—To be used sometimes instead of the top pad, and sometimes as a third pad when the back of the chair is stretched to full length.

SPITTOON ATTACHMENT—see in the cut—is a cheap and convenient substitute for a separate spittoon. Is more convenient and costs less.

HEAD-REST.—The Morrison Head-Rest is a *thoroughly* good one, and has given general satisfaction. It is supplied with the chair if we are not otherwise directed, and the price of the chair as named includes this rest. The Johnston Head-Rest is *our latest*, and is everywhere approved. It can be had with the chair at an extra cost of $8.00. It is shown in the cuts.

EXTRA UPHOLSTERY.

Turkish Upholstery.

Some persons having desired a softer style of upholstery than is usual in dental chairs, we have adopted, after many experiments, a modification of what is usually known as the Turkish chair. The seat is made about four inches higher in front than at the back, and both it and the lower back are made very soft by the liberal use of steel springs and hair, the edges being kept full by a piece of heavy spring wire which is built into the upholstery.

The perpendicular edges are covered with a puffing to match, and "set off" with handsome silk cord.

The arms and upper back pads are made heavier than usual, and are puffed and corded to match the seat.

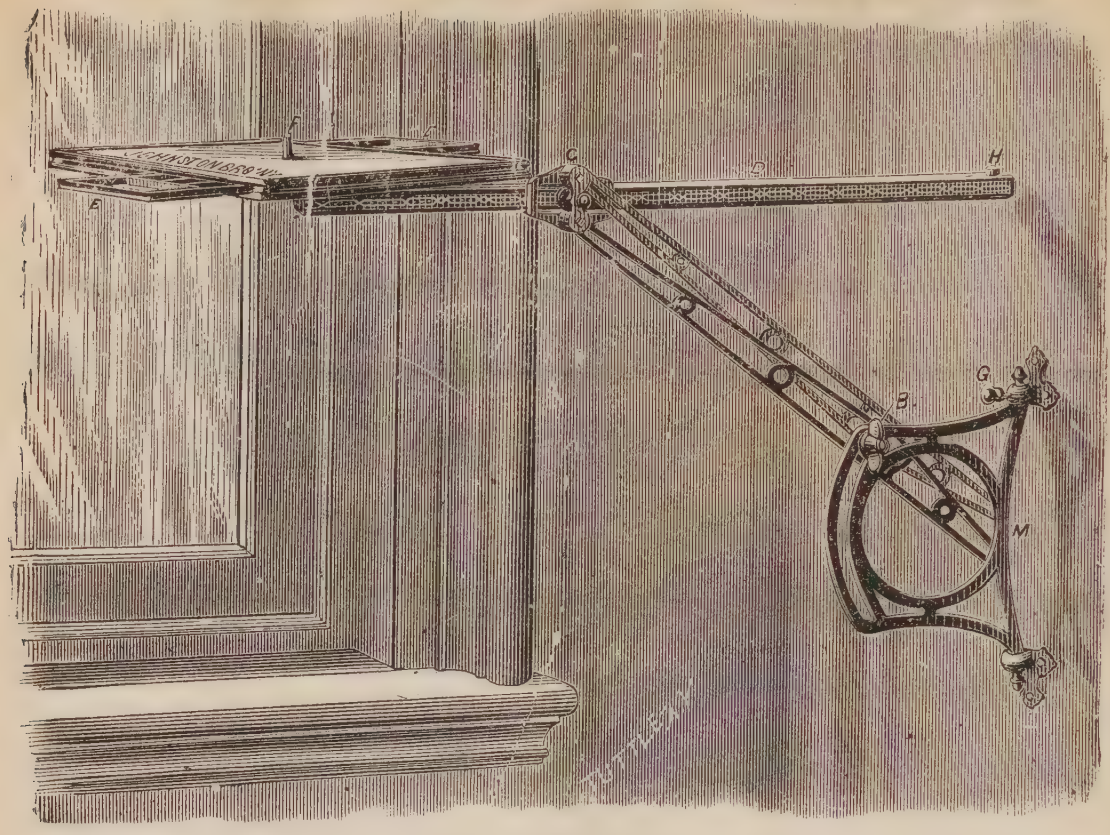
Real Morocco.

We also have produced a very elegant article by the use of real morocco, handsomely embossed. It is durable and particularly desirable for warm climates.

PRICES.

In fine green or garnet plush—with Morrison Head-rest	$ 150.00
Boxing	5.00
To which price add, if ordered:	
With Castors	10.00
With Johnston Head-rest, instead of Morrison	8.00
With extra back-pad	4.50
With spittoon attachment and porcelain cuspador	8.00
With nickled metallic cuspador and gold trap	10.00
With nickled metallic cuspador and gold trap, and nickled spittoon attachment	18.00
With Turkish upholstery	15.00
Real morocco embossed	10.00

MORRISON DENTAL BRACKET.



PRICES.

With Black Walnut Table, 12 inches square.....$25.00.
With Rosewood Table, 14 inches square, and Velvet Top, and Drawers about five-eighth inch deep, lined with Leather..... 40.00.
The Rosewood Table alone, as above, to fit any Morrison Bracket..... 17.00.
Boxing.....$1.00.

The cut represents the table in its highest position, and distant from the wall a little more than half the distance it is capable of taking. By loosening the thumb-screw B, and allowing it to rest in the bottom of the slot, (instead of at the top as represented here,) the table will occupy a position as much below M as it now does above the same point. The extreme range, that is, the distance between the table when at its highest and its lowest position, is 24 inches.

M represents a metal frame which is secured to the wall or other support by screws. It swings from side to side as a gate on its hinges. C. M. represent light but strong metallic arms, hinged at M as a centre and moving up or down. At B is a thumb-screw passing through a slot in the frame M. By it the arms can be firmly clamped at any desired height.

At C is a slide-rest through which the hollow rod D passes freely, and may be clamped at any distance from its ends. At one end of this bar a square table is supported, having in it foil and instrument drawers. This table is capable of rotation round F, which is the burner of an alcohol lamp, the alcohol being contained in D and introduced at its further extremity H. Among the advantages of this bracket are these:

1st. It combines a greater variety of range and movement than any other.
2d. It is rigid in whatever position it is clamped, and will hold 15 lbs. with steadiness.
3d. It provides a clean receptacle for foil and instruments.
4th. It is obvious that a square table is very much more convenient as an instrument stand than a round one.
5th. Its drawers extend through the table and can be opened from either side.
6th. To those having a Morrison Chair it is almost indispensable, as it will follow the chair to either its lowest or its highest position.

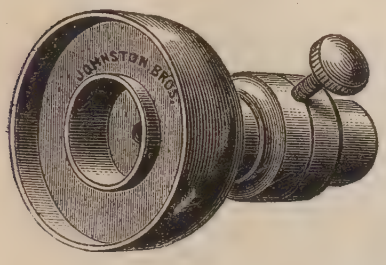
It is handsomely ornamented and nickel-plated throughout, so that it is a very beautiful addition to the furniture of the operating room.

JOHNSTON BROTHERS,
16 Broadway, cor. 32d St., N. Y.

SHANNON'S DISK MOUNTER.

THE INVENTION OF DR. W. T. SHANNON.

The SHANNON DISK MOUNTER enables one to do well with the greatest rapidity, what before has been done imperfectly and slowly by such dentists as have essayed the task at all. The directions are simple enough. To mount an "Arthur" or other disk so that it will be perfectly true on its mandrel: Take a screw mandrel or an old bur, warm the end which is to be bedded in the corundum over a spirit lamp, then pass it through the center of the disk; then, while still warm, pass the mandrel into the large end of the mounter, and press the disk on to it, having the face of the disk held firmly against the face of the mounter until it cools, and so is fastened—when it will be found to be true.



Price, - - - - - - - - $1 00

JOHNSTON BROS.

Patent applied for. 1260 BROADWAY, N. Y.

IRIDIUM PLATINA NERVE BROACHES.

They possess the following advantages:

They do not corode in the slightest degree, even when exposed to moisture, acids, iodine, or other medicines.

They can be cleansed perfectly from diseased matter, which gets on them when used to extract dead nerves, or from traces of medicines used in treating diseased teeth, by heating to redness in the flame of a spirit lamp.

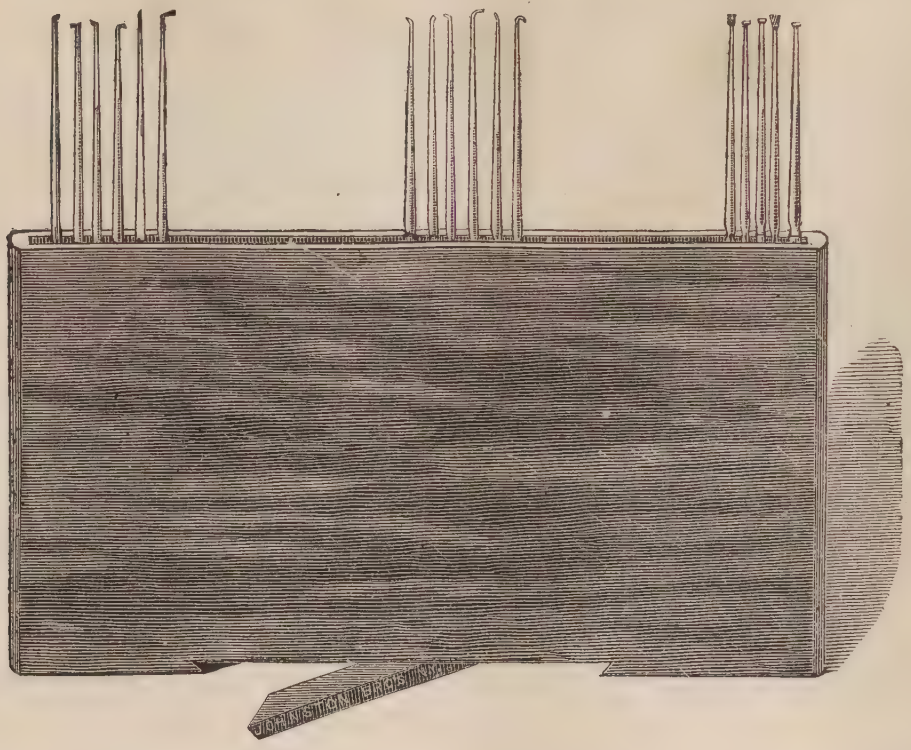
Price, per package (½ dozen)..... $1 50

" (¼ " 75

JOHNSTON BROS,

1260 Broadway, N. Y.

Fitch's Instrument Stand.



Both time and money are saved by any arrangement by which a dentist's tools are so distributed that he can at a glance recognize, and conveniently lay hold of any desired point.

It is a further convenience, if, when night comes, he may lay them in his drawer secure from dust without disarranging them. Dr. Fitch, of Lee, Mass., has designed an instrument stand for hand tools which combines these advantages. When placed on the table for use it is firm in its upright position, and the point of each instrument in it is distinctly presented to view. When its foot is closed into its base it is but 5-8 of an inch thick, and can be laid flat in any drawer without disturbing the instruments.

We make two sizes—No. 1, for excavating burs, &c., having 3-16 inch handles; No. 2, for pluggers, &c., having 3-8 inch handles.

Price of each.....$1.50

JOHNSTON BROTHERS,

Broadway, cor. 32d St., N. Y.

JACK SCREWS.--Old Style.

LENGTH WHEN CLOSED.	LENGTH WHEN EXTENDED.
No. 1. ———	No. 1. ———
No. 2. ———	No. 2. ———

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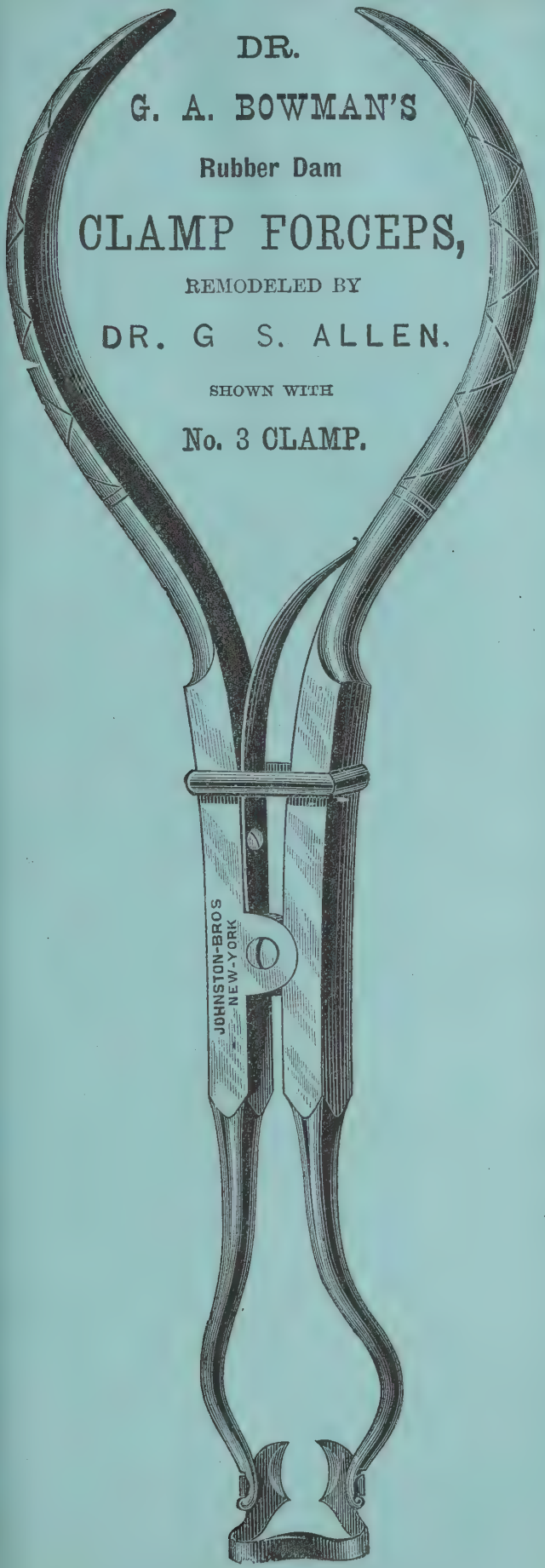

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Vol. V.——*December, 1878.*——No. 60.

SUNLIGHT AND SOLARIZATION IN HEALTH AND DISEASE.

By E. C. Angell, M. D.

(*Concluded.*)

The famous Florence Nightingale names light as but little less important for the sick than fresh air, and says, in her "Notes on Hospitals": "Not only daylight, but direct sunlight, is necessary for speedy recovery, except, perhaps, in certain ophthalmic and a small number of other cases. Innumerable instances could be given where, in dark wards (or in wards with northern exposure, even when thoroughly warmed; or in wards with borrowed light, even when thoroughly ventilated), the sick could not by any means be made speedily to recover. Window blinds can always moderate the light of a light ward, but the gloom of dark wards is irremediable. We can generate warmth; we cannot generate daylight or the purifying effects of the sun's rays."

Further testimony as to the therapeutic value of sunlight is borne by the "Dictionary of Materia Medica" of Murat and De Lens, which says: "We cannot doubt that the influence of light is one of the conditions most indispensable to health, and that it may consequently be usefully employed by the therapeutist. It acts as a powerful excitant of the organism, and particularly of the functions of the skin, in cases of general atony, of chlorosis, of lucophlegmasia, of scurvy; in rickets, in scrofula, in chronic engorgement of the viscera; it is, above all, highly useful in convalescence."

A recent and practical English writer, in A. Winter Blyth's "Dictionary of Hygiene and Public Health," treats this question as follows: "The direct rays of the sun are great remedial and preventive agents in certain diseases, such as scrofula, phthisis, rickets," etc.

Among the records of particular cases, a striking one is furnished by the celebrated Baron Dupuytren. A Parisian lady who had many physicians, none of whom could cope with the complication of diseases which afflicted her, applied to the Baron as a last resort. Being unable to suggest any drug treatment which she had not already tried in vain, he contented himself with directing that she be removed from the dark street and dismal rooms in which she had been living to a brighter part of the city, and exposed as much as possible to the light. The result of this, as related by Dupuytren, was the rapid improvement and ultimate complete recovery of the patient.

J. F. Cauvin, whose thesis on the benefits of insolation has been already mentioned, cites therein at much length the case of a college classmate, aged twenty-three years, who suffered from a severe attack of acute articular rheumatism. The swelling of the knee and ankle-joint were persistent, defied all treatment, and made the use of his legs impossible. At last insolation was employed, the solar rays being concentrated upon the diseased parts with the gratifying result of an entire recovery.

In another instance he succeeded in removing a poor workman, his wife, and family of eight children, from their dark and gloomy quarters in the city, and placing them with a rich farmer in the country, where they were received through charity, and though their food consisted only of brown bread and a little soup each day, he says: "I had the pleasure at the end of a week, to see the evil changed to good; that is to say, their entire systems, which were wasting away daily, took a turn toward good health, which became more and more evident. It was fortunately the month of April, and the weather was dry. Every day I ordered them to remain in the sun alongside of a wall as long as possible. I made them cleanse their bodies at frequent intervals with warm water and soap, in order that they might be better penetrated by the solar rays and the pure air. At the end of a month and half I saw the disappearance of the numerous affections from which they had suffered. The father had an indolent scrofulous ophtalmia. Despite the acute character which this phlegmasia took at the beginning, I directed him to persist in his work in the open air and sunshine, being careful merely to have him wear an

eye-shade of green taffeta. The vital forces, regulated by insolation, led to a perfect cure. The scurvy or ulcerous eruptions, with which three of the children were covered, likewise disappeared. Of the younger children, one had an obstinate whooping-cough; in two others the glandular system was scrofulously congested. I made them lie in the sun during several hours each day, and they were perfectly cured."

Cauvin quotes Professor Dubois, one of the faculty at that time, as saying, when some miserable little wretches had been brought by their parents before the class for treatment: "Take these children to the country, feed them as well as you can, but above all roast them—roast them in the sun."

The late David Urquhart, through whose instrumentality Turkish bathing was re-established in Western Europe, was also a believer in insolation, and has recorded the case of a woman who was abandoned to die of consumption by her physicians, but whose health was restored by divesting her of tight and dark clothing and making her lie in the sun every hour that it shone. The later years of Mr. Urquhart's life were passed in the Swiss Alps in endeavoring to ameliorate the sufferings incident to insufficient sunshine. It is well known to visitors of those regions that in the deep valleys the sun shines only a few hours each day, and, as a consequence, the inhabitants suffer terribly from scrofula and other diseases incident to poor nutrition. The women, almost without exception, are deformed by huge goitres, which hang pendulous from their necks, unless supported by slings. A considerable portion of the males are idiots. Higher up the sides of the mountains the inhabitants are remarkably hardy, and are well developed mentally and physically. The only difference in the mode of life is in the greater amount of sunshine, and when these poor unfortunates below are carried up the mountains they improve with great rapidity.

The beneficial effects of sunshine are remarkably illustrated in the experience of Dr. Warren, as recorded by himself in *Public Opinion* of August 8th, 1863. He says: "Seclusion from sunshine is one of the misfortunes of our civilized life. The same causes which make the potato vines white and sickly when grown in dark cellars, operate to produce the pale, sickly girls that are reared in our parlors. Expose either to the direct rays of the sun and they begin to show color, health and strength. One of the ablest lawyers in our country, a victim of long and hard brain labor, came to me, a year ago, suffering with partial paralysis. The right leg and hip were reduced in size, with constant pain in the

loins. He was obliged, in coming upstairs, to raise the left foot first on every stair, dragging the right one after it. Pale, feeble, miserable, he told me he had been failing several years, and closed with, 'My work is done. At sixty I find myself worn out.' I directed him to lie down under a large window, and to allow the sun to fall upon every part of his body—at first ten minutes a day, increasing the time until he could expose himself to the direct rays of the sun a full hour. His habits were not essentially altered in any other particular. In six months he came running upstairs like a vigorous man of forty, and declared with sparkling eyes, 'I have twenty years more of work in me.' I have assisted many dyspeptics, neuralgic, rheumatic and hypochondriacal people into health by the sun cure. I have so many facts illustrating the wonderful power of the sun's direct rays in curing certain classes of invalids, that I have seriously thought of publishing a work to be denominated the 'Sun Cure.'"

Dr. Hammond, in a paper published in the first volume of *The Sanitarian*, arrives at the following conclusions: "Care should be taken both in health and disease to insure a sufficient amount of light, and it is impossible to rear well-formed, strong and robust children unless attention is paid to this requirement. Sun baths, or apartments in which the solar rays can fall upon the naked body, are highly advantageous to health, and rooms for this purpose could easily be constructed in most of our city houses. Let us then, to use the dying words of Humboldt, have 'mehr licht.'"

Dr. Emmet strongly advocates sunshine, and observes that the tonic advantages of iron are greatly augmented by direct exposure of the body to the solar rays.

Dr. J. H. Kellogg, in a suggestive volume on health, recently published, says: "Sunlight surpasses all other agents in restoring color to the blanched and ghost-like faces of long-housed invalids, and sun-baths, rightly used, are powerful remedies for disease."

Among the attractive features of that excellent edifice, the New York Hospital, is its *solarium*, situated on the top of a portion of the structure and inclosed in glass, serving also the purpose of a conservatory. Here, in sunny days, are congregated many patients, and they certainly have the appearance of being very comfortable. The great Hospital of St. John, at Brussels, has on the roof an elegant garden, tastefully laid off, and planted with shrubs, small trees and a grass lawn, interspersed with flagrant flowers. In this quiet rural retreat, patients, particularly con-

valescents, are permitted at certain hours of the day to promenade, indulging in the luxury of good air and bright sunlight. There are few of our hospitals that might not profitably imitate these examples, and not only construct rooms enclosed with glass, but, better still, rooms without glass, where direct solarization can be employed with the most gratifying and salutary results.

My own personal observation of the efficacious results of the therapeutic use of the solar rays extends over a period of fully twelve years, and embraces a considerable variety of diseased conditions, for the most part chronic. I will cite a few in which I think the very marked benefits produced were directly due to insolation.

A most persistent case of acne, which covered the face, chest, back and shoulders, and which for many months resisted all hygienic and remedial measures, was effectually and speedily cured by exposure to the solar rays, the general diminution of the eruption being observable from the very beginning of the treatment. I have since employed this agent in several obstinate cases of this annoying and unsightly affection, and in every instance the eruption has heen speedily dispelled, while every case has been immeasurably improved in general condition and tone. A case of chronic eczema of the most stubborn type yielded completely to the potent influence of the sun after three exposures, of one hour each, to its healing rays.

In dyspeptic conditions I have observed the very best results from frequent and prolonged insolation. I recall, in particular, the case of a young Englishman who had been a great sufferer from dyspepsia, and had derived only limited benefit from a long continued course of general treatment, but who speedily acquired, by regular exposure to the sun, the health, development and vigor of an accomplished athlete. Another Englishman, who had been steadily losing strength and weight, in spite of various remedial measures—his trouble being in part mental—gained ten pounds in three weeks by daily insolation, and remained heavier and stronger for the next twelve months.

Still another case of dyspepsia, with much emaciation, gained twenty pounds in six weeks by the same treatment. In regard to increase of weight, it should be observed that the first effect of insolation is to reduce weight, as a stout person, accustomed to solarization, may lose two, four, six, and even ten pounds in a single prolonged exposure, and gain correspondingly in buoyancy and vigor.

A gentleman from the British provinces, suffering from partial de-

mentia or incipient insanity, was so greatly benefited by a course of judicious insolation that in a few weeks his melancholia was completely routed, and he was enabled to return to his friends and business.

A lady of middle age, suffering from chronic bronchial catarrh, found great improvement from each insolation, and, before she had taken twelve, this disability was entirely removed ; but what surprised her most was the fact that hay fever, from which she had suffered the five years preceding, did not return. The treatment of this case involved on each occasion one hour under colored glass and a half hour of direct insolation, accompanied with anointing of the entire cutaneous surface.

It is hardly essential to cite further authorities or cases to prove the feasibility and value of the therapeutic employment of the sun's rays. Something should be said, however, of the curious development of solar therapeutics which has taken place outside the profession as a result of what is known as the "blue glass theory." Setting aside the effect on the patient's imagination, which is often a potent element in new remedies, if not in old ones, whatever good may have been accomplished by the use of blue glass as a remedial agent is of course due to the solar rays. And we can well afford to pass without criticism the questionable facts, and still more questionable philosophy, of the military gentleman who originated the blue glass mania, in view of the good service he has done in turning the attention of the public and the profession to the real value of sunshine.

All the talk, however, about blue light and red light has raised a crowd of questions of more apparent than real importance. As every one knows, the pure white light of the sun is resolved by the prism into rays of seven distinct colors, namely : Violet, indigo, blue, green, yellow, orange and red. It is agreed, furthermore, among scientific men, that what we call heat is most marked upon the red side of this spectrum, actinism is most powerful upon the opposite or violet side, and light is strongest next the heat, that is, in the orange and yellow rays. Besides these there are invisible heat rays beyond the red, and invisible actinic rays far beyond the violet. Again, it is established beyond doubt, that the rays of different colors exercise very different effects upon animal and vegetable life.

Becklard found, for instance, that flies' eggs were readily hatched under different colored glasses, but that subsequent development was much the greater under blue or violet glass. Dr. D. P. Gardner made, in Virginia, in 1843, a series of experiments, not with colored

glasses, but with the colored rays actually separated by a prism, and he found that the yellow ray was much the most potent in producing the green coloring matter of plants, while the violet ray is the principal attraction by virtue of which plants turn toward the light. R. Hunt, who experimented about the same time with colored glasses and solutions, found vegetation most vigorous under the blue. This kind of investigation has greatly excited the amateur solar therapeutists. The champions of blue light and red light are already in the field with riva volumes, and it is not unreasonable to look next for some one "wearing of the green" in a remedial fashion.

I am pretty thoroughly convinced, however, that these subtleties, while worth testing from motives of scientific curiosity, are not likely to prove of any very essential therapeutic value. Nevertheless, blue glass may serve a very useful purpose. It is often desirable and sometimes necessary, in the case of those unaccustomed to direct sunshine, to cut off a part of the heat, and perhaps a part of the light, while retaining as much as possible of the actinic rays. There is, probably, no better means of accomplishing this than by the employment of a screen of blue glass, which arrests a considerable portion of the heat and light, while retaining in nearly normal force the actinic rays, as shown by the experiments of Becquerel in 1839.

It has been asserted that blue glass increases heat, but the claim is no well founded, as the darker the glass the more it absorbs heat and light, and the more it diminishes both. This is shown in heat by Crook's radiometer, which, under white glass, gives in the sun one hundred and seventy revolutions ; interpose blue glass and the revolutions diminish to sixty.

The same useful purpose served by blue glass goggles in case of weak eyes, may be served by blue glass screens in case of bodies too weak to bear a free exposure to the solar rays. And as it is desirable to dispense with such goggles as soon as practicable, it is equally desirable to lay aside the blue glass screen and submit the patient, as soon as may be, to the full force of the sunshine.

I have found it almost impossible for sensitive patients, suffering from nervous affections, to remain long enough under white glass, or without glass, to be in any material sense benefited, from the intensity of both light and heat. Under blue glass, however, both are so modified that the same persons may remain almost indefinitely, with pleasure and profit ; and I am fully satisfied, after a considerable experience with this

agent, that by its introduction into solar therapeutics the sun's rays may be safely and profitably administered to even the most delicate and nervously susceptible of patients. I might almost say that there is no morbid condition in which sunshine, modified by blue glass, is contra indicated.

Dr. Ponza, an Italian physician, found blue light soothing to the insane; and by violet light, in one instance, a crazy person was in one day cured. In some extreme cases, even behind blue glass, eye-shades and thin coverings for the head might be advantageous, as they generally are in direct insolation. To secure the best effect, however, the entire body should be exposed to the light. When the direct rays are employed a preliminary anointing of the entire surface of the body with some simple unguent is advantageous, especially if the skin is eruptive, inert, or sensitive ; and, if the exposure is prolonged and the sun in full force, it is generally advisable to repeat the inunction every half hour, or oftener.

It is important that the solarium should be well ventilated, and the best results, it will be recalled, are recorded of open-air insolation. Modern costume deprives the body so much of light and air that the skin lacks sensibility as well as tone ; and there is not only great advantage to be derived from the sun, but there is often much benefit received from exposure to the wind.

The sun alone reddens, the sun and wind conjoined magnificently bronze the exposed surface in a manner that the Winter months will not efface, while the benefits and strengthening effects are still more lasting. Insolation under glass, however, whether white or colored, is a bleaching process, in which there is neither burning nor discoloration.

The construction of a *solarium* is very simple. Its situation, in cities, should always be at the top of the house, and a high house at that, that it may admit air, light and sunshine from all sides. The roof should consist of sash and glass—an outer layer of white glass and an inner layer of blue glass—with an air space of an inch or more between. The sides should have double sash as well as double glass, and may be ornamented with varied colors and figures to amuse the eye and please the fancy. This mode of construction will diminish the intensity of the heat in Summer and the cold in Winter, and practically makes the structure available for every day in the year on which the sun shines.

Leading from the apartment already described should be another, with enclosed sides of lattice, consisting of revolving blinds. This room

should be open at the top, and would only be available during the warm season. The use of the blinds are threefold—to screen the inmates, to regulate light and shade, and to temper the winds to the nude tenants.

In conclusion, I will not go quite as far as Voltaire, who advised two dull actors to plant themselves out in the sun for six months ; but I will take the liberty to urge an increased attention to solar therapeutics on the part of the medical profession, for the sun's rays may be employed with absolute advantage and with as absolute safety.

Whenever the blood is impoverished and the red corpuscles are few; whenever the vital forces of childhood or age are weak, whenever convalescence is lingeringly slow without obvious cause; plunge the patient into sunshine as strong as it can be borne, and as constantly and as continuously as possible.

In asthma, bronchitis, catarrh, dyspepsia, gout, malaria, or rheumatism, and above all as a means of saving the stout from fatty degeneration, or in many acute, and nearly all chronic maladies, insolation is richly worth repeated trials, and offers fair promises of excellent results.

It was asserted by Father Labat that the savages on the Mississippi used to cure syphilitic cases by the strange treatment of administering two or three violent purges, followed by exposure to the sun all day upon the sand. Dr. Livingston found syphilis unknown in Central Africa, and even after its introduction by visitors from the coast, it met with a spontaneous cure among the natives who remained—their scanty clothing and constant exposure to the sun the supposed probable cause of the cure.

It would be strange enough if strong sunshine should be found to possess power to expel or neutralize a malady that has proved not only exceedingly difficult to cure, but so impossible to quarantine.

Without anticipating medical miracles, the professional practitioner may rely upon deriving from judicious insolation such ruddy complexions, hardened muscles, improved digestion, purified blood, enlivened spirits, and invigorated vital powers, as shall more than justify all I have advanced in defense or praise of solarization.

CONNECTICUT VALLEY DENTAL SOCIETY.

The fifteenth annual meeting of the Connecticut Valley Dental Society was held at the Haynes House, Springfield, Mass., Oct. 22d and 23d, 1878, President L. C. Taylor, of Hartford, Conn., in the chair.

The morning session of the first day was occupied mainly by listening to reports and the disposition of business of minor importance.

A communication was received from the Massachusetts Dental Society, inviting the Connecticut Valley Society to unite in a joint convention with itself and other sister societies of New England, at Boston, next June, which was referred to a committee of five appointed by the chair.

The first business in order, in the afternoon, was the election of officers for the ensuing year, which resulted as follows, to wit :

President—C. A. Brackett, Newport, R. I.

Vice-Presidents—C. S. Hurlbut, Springfield, Mass.; C. Fones, Bridgeport, Conn.

Secretary—C. T. Stockwell, Springfield, Mass.

Assistant Secretary—George W. Crittenden, Northampton, Mass.

Treasurer—N. Morgan, Springfield, Mass.

Executive Committee—P. H. Derby, Springfield, Mass.; Jas. McManus, Hartford, Conn.; J. N. Davenport, Northampton, Mass.

Then followed the annual address by the retiring President, Dr L. C. Taylor, of Hartford, Conn., and the induction of the officers elect. "First-Class Dentistry" was the topic chosen by Dr. Taylor, who, after thanking the Society for the honor they had conferred upon him in placing him in the executive chair, and gratefully recognizing the kindly attention and harmony manifested during the past year, proceeded to note the various degrees of qualification which have been recognized along down the history of the past as the standard of "First-Class Dentistry," showing that development and advancement has been constantly the tendency, and that the standard is constantly being raised, necessitating on the part of the dental student a broader culture and opening a wider field of investigation and research.

He claimed: "That the time has come when the term dentist should mean something more than the definition given by Webster, to wit: 'one who cleans, extracts, repairs or fills natural teeth and makes artificial ones.' While the above is, without doubt, the extent of the knowledge many possess, there are those who try to know something of the indications of nature, and aim to assist her when the enemy has entered the field, rather than to wait until devastation pervades the entire premises." To be able to *anticipate* what is in *store* for our patients requires a thorough preparation on the part of him who is to assume the responsibility of educating and caring for those who place themselves in his hands.

To be a first-class dentist, according to the modern interpretation of the term, involves, first, natural ability, also a true love and taste for the calling; second, we must have natural ability developed by at at least a fair *general* education, together with a *thorough dental education.* If the mind and hand are thus properly educated, we must then unite the third essential quality, *good judgment.* If we add to these a *careful observation,* we may proceed to the practice of the profession with a fair expectation of attaining, in some degree, to the standard of the present day.

He urged the study of each case presented, with a view of ascertaining if there is anything to be learned more than how many cavities there may be, or if there is a chance to make an artificial set and obtain a small fee for the same. Our patients submit themselves to our care and wish to have their mouths put in good condition, leaving the matter to our judgment as to what shall constitute that condition. With such a call comes a sacred responsibility. We should never undertake a case unless we can give it a *thorough* and *careful* examination, which usually involves no small amount of time. Our advice should never be given at random, but should be based upon positive knowledge of the case in question. To be a first-class dentist implies that we are so thoroughly versed with the indications of nature as to anticipate, in a measure at least, how far she will be able to complete her own efforts; and at any time, should it appear that there are causes working against her, to be able to remove them. But the best time to anticipate these causes is in childhood, or at least as soon as the patient enters his or her teens.

It is not my purpose to direct as to any prescribed method, but leave that to the better judgment of each of my hearers. My purpose is to *advocate the importance of a better course of treatment* of children's mouths, between the ages of seven and twenty. It is a very true saying that "as the twig is bent so the tree will grow." The same is equally true in relation to the dentition of the young. I do not believe that the first-class dentist is he, who, when consulted regarding the mouth of a young patient, reports that it is all right, because there are no visible cavities he can fill. There may be many and varied causes at work in that mouth that will be fatal if allowed to remain unnoticed The duty of him who is consulted is to know what these causes are and to apply the true remedy, in order that they may be removed and nature be thereby allowed to accomplish her work. The question is not as to how many

teeth may be saved to-day, or this year, but, rather, how can we aid in procuring for our patients the best condition of the teeth when they are forty years of age? To be able to accomplish this requires a thorough knowledge of the changes that must occur in the order of development from childhood to maturity.

As to the matter of how the student shall obtain this knowledge, he proceeded to advise, first, a thorough acquaintance with the daily routine of the private office, in regard to all its particulars—such as a careful and proper care of the office, personal cleanliness, always being careful to wash the hands before seeing each patient, &c. ; a thorough and systematic course in some of the first-class colleges of the present time——and, also, by an interchange of ideas with one's associates.

It is very evident that no one can gain at all times, all there is to be gained, except he receive from the general store—and occasions like this are exceedingly helpful in this direction and will more than repay for the trouble and expense of attendance by the acquisition of valuable ideas which would otherwise be lost.

The Committee to whom was referred the invitation of the Mass. Dental Society to meet in joint convention at Boston next June, reported the following resolution, to wit :

"*Resolved*—That the Conn. Valley Dental Society approve of the suggestion of the Mass. Dental Society that a union Convention of all the New England Societies be held next June, and hereby appoint the President, Secretary, and Executive Committee of this Society as a Committee, with full power to co-operate with the representatives of sister societies to arrange for such a meeting.

Respectfully submitted.

L. D. Shepard,
J. S. Hurlbut,
F. Searle,
H. M. Miller,
C. Fones,
Committee.

The report was unanimously adopted.

Drs. D. Miller and Morgan were then appointed a committee to escort the President elect to the chair. Being presented by the committee Dr. Taylor received and presented Dr. Brackett to the Society, with the ollowing words :

"Dr. Brackett, it affords me great pleasure to welcome you to the chief executive office of this Society.

Gentlemen: Allow me to introduce to you our President elect, Dr. C. A. Brackett, of Newport, R. I."

Dr. Brackett replied substantially as follows:

GENTLEMEN OF THE CONNECTICUT VALLEY DENTAL SOCIETY: This honor that you have conferred upon me is an honor unsought and undeserved, but an honor that is in the highest degree appreciated. I am proud to be the successor of such men as have hitherto presided over your deliberations, and especially so that my election has come about in the way that it has. The Connecticut Valley Society was the first dental organization, aside from my college alumni society, to favor me with membership; and my associations with this Society and with this locality are of the pleasantest. It was in the Connecticut Valley that I began my dental studies, and it was in the office of the gentleman who has just now so happily presented me to you and so gracefully resigned the chair in my behalf that I gained my first practical knowledge of dentistry. Much of the encouragement that I had as a student, and much of the early recognition that I had as a young graduate, were from men whose faces I now see before me. I should be very ungrateful indeed not to cherish always a cordial regard for this Society and its members. If the Connecticut Valley Society were characterized by strifes and jealousies and bickerings, I might hesitate about assuming the position to which you have elected me, but I know you as a working Society; a Society which seeks to know and spread the truth; a Society ready always to extend a helping hand to him who is honest and earnest and anxious to learn. I know that in my presidency I shall have your cordial support and assistance; and I know that any shortcomings of mine will be covered with the mantle of your charity.

The 10th article of the programme, "Essays and Discussions," was then taken up and the following paper on "*Innervation of the Salivary Glands*" was read by Dr. E. S. Niles, of the Harvard Dental School.

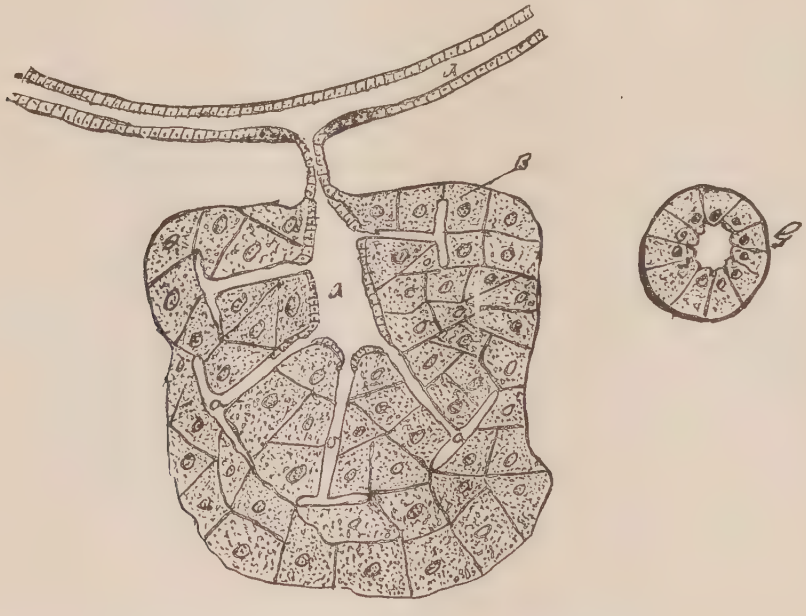
INNERVATION OF THE SALIVARY GLANDS.

The glands concerned in salivary secretion are the paroted, submaxillary and sublingual, which are classed as true racemose glands. When injected with mercury and their alveoli are dilated they very closely resemble a bunch of grapes, from which resemblance their name (racemose) is derived. Supposing the stem of the grape to be their

ducts the comparison is very complete. On close examination, however, the dilatations prove to be but the enlarged ends of the ducts, and in the recent state are somewhat flattened and elongated from lying in close proximity to each other.

Internally they are lined with glandular secreting epithelium, in many cases nearly filling the alveoli (or glandular follicles), leaving barely space for transudation of saliva to the ducts, which ducts unite to form larger and larger ones, until they ultimately form the main excretory duct of the gland.

The epithelium in the alveoli and lining the ducts is substantially the same. That in the latter is perhaps smaller with nuclei situated nearer the internal end of the cell. Both cells are finely granular bodies of protoplasm. Each provided with an oval nucleus situated (except in the case just mentioned) towards the central part of the cell. According to the measurement of Dalton the cells are 15 m. m. m. in diameter.



HIGHLY MAGNIFIED SECTION OF THE SALIVARY GLAND OF COCKROACH.

A. Salivary ducts. *B.* Gland Cells of a longitudinal section of alveoli and ducts. *G. Transverse section of duct.*

The alveoli are surrounded by a delicate network of connective tissue which forms the frame work of the gland, and through which are distributed the afferent and efferent nerves, blood vessels and lymphatics. In general the anatomical description of one gland fairly represents the whole. Their physiological functions, however, are very unlike.

Saliva collected from Steno's duct is a thin watery secretion, very well adapted to permeate and soften the food as it is crushed and worked between the molars. That from Wharton's is more viscid, whose office undoubtedly is to envelope the bolus or mass of food with its viscid substance, thus assisting essentially in deglutition. The sublingual secretion has been very little studied, owing to the difficulty of collecting it free from that of the other glands. What observations have been made show that it secrets a fluid thicker than the submaxillary. The latter being intermediate between the paroted and sublingual.

Thus we see that although apparently their anatomical arrangement may be the same their functions are very different, and each one has its particular part to perform independently of the other.

But little need be said in this connection regarding the saliva as a whole. The old practitioners whose fingers (one may say) are soddened with salivary secretions, no doubt have viewed it in all its phases and forms.

With these preliminary remarks we pass to the innervation or nervous mechanism that causes the activity of these glands, which is more particularly the subject of the paper.

We well know the abundant flow of saliva on irritation of the tongue, mucous membrane of mouth, aesophagus or stomach. Or taking food into the mouth, even the sight, smell and thought of food to a hungry person causes a copious secretion from these glands as well as the mucous glands of the mouth and stomach.

All this convinces us that a nervous impulse has been conveyed through a channel of special sense to a center in the brain, whose office it is to preside over and excite salivary secretion, and that there must be some arrangement in the gland which readily responds to this stimulus.

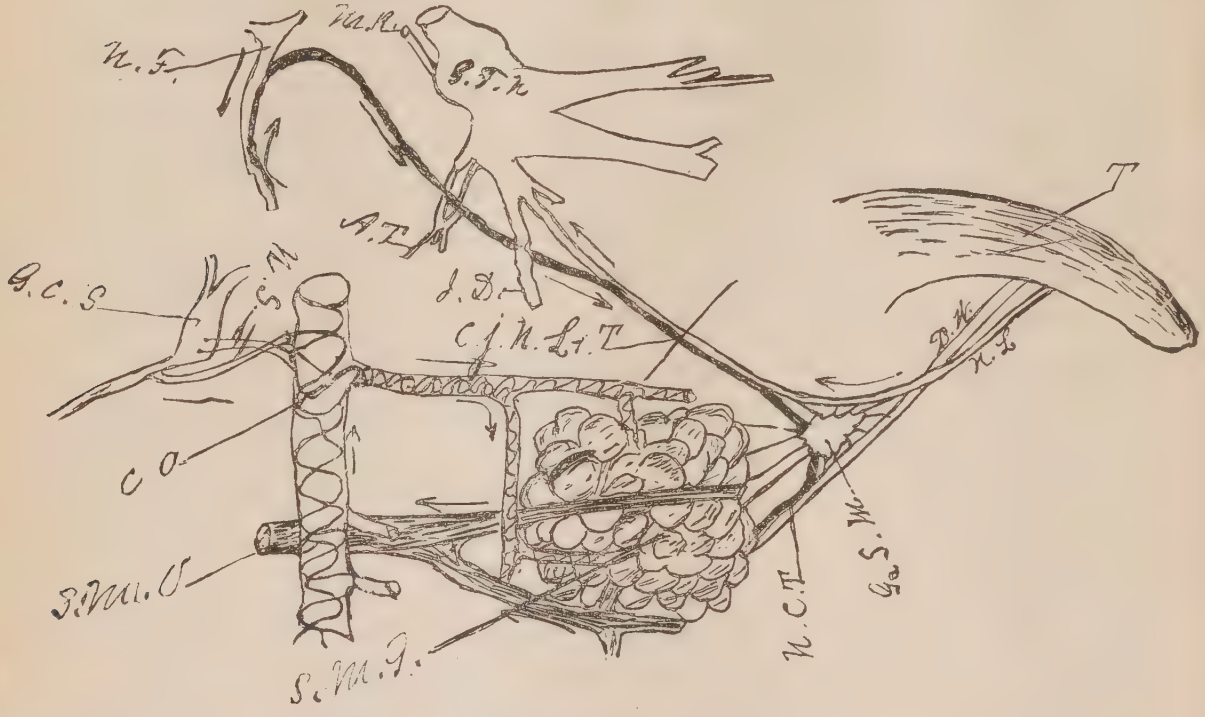
This is undoubtedly a nervous reflex action, and is continued at all times, whether awake or asleep.

In the intervals of mastication barely saliva enough is secreted to keep the mouth moist. It has been asserted that the whole amount secreted in twenty-four hours will exceed two liters, or three and one-half English pints.

In the study of this nervous action, the submaxillary gland, for several reasons, has been chosen as the subject of experiment, and it will be to this gland that I shall confine myself more particularly.

It is supplied with two sets of nerve fibers, having entirely different functions. One from the cervical sympathetic, along the submaxillary

artery. Another from the seventh or facial, by fibers which run in the chorda-tympani, joining the lingual branch of the fifth nerve, diverging close under the lower jaw to run beside Wharton's duct to the gland.



Diagramatic Drawing of the Parts Concerned in Salivary Secretion.

N C T—Chorda-tympani nerve. *S M G*—Submaxillary gland. *Ga S M*—Submaxillary ganglion. *D W*—Wharton's duct. *N L*—Lingual nerve. *T*—Tongue. *Cj N L T*—Conjoined lingual and chorda-tympani; where Bernard made the division. *G F N*—Ganglia of the fifth pair of nerves. *Mr R*—Motor root of fifth nerve. *N F*—Facial nerve. *A T*—Auriclo temporal, which supplies motor nerve to parotid gland. *N S*—Sympathetic nerve; point of Bernard's division. *G C S*—Cervical sympathetic ganglion. *C A*—Carotid artery and branches to gland. *S M V*—Submaxillary vein. *I D*—Inferior dental nerve.

Bernard (Professor of General Physiology at the Academy of Science, Paris), in his experiments upon the horse and dog, found that if these parts be laid bare and a tube placed in Wharton's duct (*D W*, Fig. 2), stimulating the lingual (*N L*) with electricity, or by application of salt to tongue, caused a copious flow of saliva.

Then he divided the sympathetic (at *N S*) and found the flow still uninterrupted.

He then divided the small chorda-tympani (at *N C T*), and all secre-

tion from this gland was arrested at once, unless the stimulous was directly applied to the gland.

This proved to him that the channel of motor or afferent impulse was through the chorda nerve. It remained now for him to find the center that received sensory impulses and conveyed the motor through the chorda to the gland.

Now the submaxillary ganglion lies in the junction where the chorda-tympani leaves the lingual, lying in a triangular space formed by the two last mentioned nerves and Wharton's duct. (See *G S M*, Fig. 2.)

Bernard, in his experiments, divided the conjoined lingual and chorda-tympani (at *Cj N L T*, Fig. 2), and found, on stimulation of the dog's tongue, that a flow of saliva was still produced.

This led him to suppose that the submaxillary ganglion might act as a reflex center, or, we may say, a little brain for the gland. This being the only instance of a sporadic ganglion acting as a reflex center, independent of the cerebro-spinal center, called out many experiments by German observers upon this gland.

Eckhard and Heidenhain failed to get the same results as Bernard. Schiff and Bibber succeeded in performing Bernard's experiment, and found that, after the motor connections from the brain were all cut, a slight secretion was caused on stimulation of the tongue or lingual nerve. If this be finally demonstrated, we are to suppose that the sensory impulses are conveyed by the lingual nerve to the ganglion, which turns over the motor impulses to that part of chorda-tympani running from the ganglion to the gland.

At present it remains a disputed point. It is, however, conceded that the submaxillary ganglion plays a part in the innervation of this gland. Whether it is able to cause the activity of the gland cell, alone, independent of other centres, is a very fine point to settle, owing to the difficulty with which experiments are performed upon the gland. Bernard may have used too strong a current of electricity, so that it escaped to the surrounding tissue and irritated the gland itself.

The more important centers are located in the brain, as is proven by the fact that impressions on the optic, auditory, olfactory and pneumogastric nerves all produce a flow of saliva, and all, with the exception of the optic and auditory have their origin in the floor of the fourth ventricle of the brain. Undoubtedly the most important center is situated in the medulla oblongata at this point, as direct stimulation causes an abundant secretion. According to Professor Burdich of the Harvard

Medical School, it cannot be confined alone at this part of the brain, as the same result may be brought about by stimulation of the cortex cerebri at several points. But, as has been mentioned, the chorda tympani is the only channel for afferent impulses to the gland. When this is cut the gland is paralyzed and secretes only as it is directly stimulated. This nerve arises in company with the seventh or facial in the floor of the fourth ventricle, accompanies the facial to the cavity of the tympanum, when it leaves it, passing between the malleus and stapes and finds exit from its long canal near the glaserian fissure. The remaining course of this nerve to the gland has been described.

Now, as we have considered the fact which the cerebro spinal system is supposed to play, we next come to the influence of the ganglionic or sympathetic system along its connection from the cervical region. Bernard found that when the gland was in full activity if this nerve be violently irritated by placing the electrodes upon it, the flow of saliva was very much lessened, in fact, almost stopped. Other observers have verified his experiment, thus proving that the sympathetic nerves antagonize those of the chorda.

Now let us see what takes place in the gland under these two opposite influences.

All glands, for the formation of their secretion, are dependent upon the blood for material. But how does the cell in the gland furnish the saliva from the blood? Does it act as a filter, just taking from the blood the already formed material for secretion, or does it draw from the circulation the common nutriment for growth of all protoplasm, and out of this, in the recesses of its own cells, manufacture its secretion? It was formerly supposed that these glands acted on the principle of a sponge, absorbing from the blood and lymph vessels during the interval of mastication, and the pressure from the jaw and muscles during mastication caused the saliva to flow. Undoubtedly this action of the muscles in mastication does assist the flow, but the absorption of material from the blood cannot be thus explained. If a massometer be placed in the duct of the gland during activity, the pressure there is found greater than that of the surrounding blood vessels, and most of us have experienced no little discomfort in seeing the saliva creeping up our napkins, or out of the corners of our patient's mouth, when the jaws were perfectly at rest. Furthermore, analysis of the blood shows that the characteristic property (Ptyaline), or saliva as a whole, is not found in the blood at all, but is formed by some metamorphosis in the gland cell itself.

This chemical change goes on more rapidly during mastication of food, giving to the secretion a higher temperature even than that of the circulation itself.

If the gland be watched when under the influence of the chorda-tympani, it will be seen that its arteries are dilated, and the whole vascular network in the surrounding tissue is in full activity. The blood flowing in the veins is light, and frequently flowing with pulsating movement.

This seems to indicate that the chorda serves two purposes: first, dilatation of the blood-vessels by calling into action some local vaso-motor center; also increasing the flow of saliva by calling the cell into action. The question naturally arises, is not the latter the result of the former, or does not the increased flow of blood cause the activity of the cell? No, this cannot be so. It is said that we work better for being fed; but feeding does not make us work in the absence of a stimulus. Although the flow of blood is increased, the tension in the arteries is diminished and that of the salivary ducts is raised. Further, if a dog's head be cut off, and the glands galvanized, a temporary flow occurs in the absence of circulation.

Thus the two-fold office of the chorda seems to be established. It must, therefore, contain two separate bundles of nerve fibers, one influencing the gland or secreting cell, the other going to the vaso-motor center, which presides over the arteries.

This arrangement seems to correspond with the innervation of the muscular system. We know that when the protoplasm of a muscle contracts, the flow of blood to it is increased. Foster very well says that these two modes in which force is set free in the living body, secreting activity and contracting activity, are nearly parallel.

As has been mentioned, the sympathetic nerves going to the gland have an influence on it the reverse of the chorda. When stimulated, the vessels contract, and secretion is arrested, the blood returns of a dark venous color, and circulation is apparently nearly stopped. Thus the gland cell has its periods of comparative repose and activity, differing in this respect from many glands of the system.

The liver stores up glycogen and gall, to be eliminated as the economy of the system requires. We have proven that no such condition of things exists to any extent in regard to the salivary glands.

I have already referred to the possibility of existing vaso-motor centers in the gland itself in which there are found ganglionic cells in abundance. Experiments show that after all nervous connections

are cut off from the gland, a direct stimulation will cause the activity of the cell. We have instances of these local centers throughout the body in its different organs. The intestines have the power of exciting peristaltic movements independent of their motor connection. Or, if the vagus be severed from its connection with the heart, it will beat when directly stimulated. This may be easily demonstrated in cold-blooded animals. The heart of a frog may be entirely isolated from the thorax without essentially interfering with its activity.

We may accordingly infer that, during the intervals of secretion, the sympathetic causes this center to act to constrict the blood vessels, while during secretion, the chorda removes this influence, which causes the vessels to dilate.

Undoubtedly there is an anatomical, and perhaps a physiological connection between the gland cell and nerve fiber. The nerves have been traced to the alveoli, and some have described them as passing into the protoplasm, and terminating in the nucleus of the cell, as seen in Fig. 3.

Fig. 3.

A—Glandular follicle highly magnified. *D*—Single nerve fiber. *B*—Nerve filaments terminating in fibrous tissue and nuclei of the cells Cockroach.

As yet the exact relation between protoplasm and nerve termination has not been established with any degree of certainty. Some observer has said that the contact was so close and general that the protoplasm seemed to be but the enlarging and spreading out of the nerve fiber itself.

This seems to be a point where science is met by a power which the

microscope and physiological laboratory as yet fails to reveal. We cannot say what may be in the advance of chemical science.

Thus far I have spoken with reference to the submaxillary gland because it has been more fruitfully studied than the parotid or sublingual. The nerves which supply the parotid with its motor impulses are the auriculo-temporal branch of the third division of the fifth pair. As far as is known, the glands in the human subject all respond to the same natural stimulus, and are governed with perfect concert of action.

Thus, to briefly sum up what we have found to be facts, we find that an impulse which calls for the secretion of saliva is first conveyed to the brain, where it is referred to the floor of the fourth ventricle, and a succession of impulses is here given to the afferent nerve of the gland. The vessels supplying them dilate; bringing larger quantities of material. At the same time the cell is called into action and saliva is manufactured and poured into the mouth. All this time continued impulses are being sent along the afferent nerves to hold the gland to its work. When the demands have been met, the impulses cease and the gland is brought to a comparative state of rest by the action of the sympathetic system.

A secretion may be accelerated by the use of mercury, or inhibited by atropia. A mental disturbance, fright, or fear, will also have the last named effect, said to have an inhibitory influence on the impulses going to the brain.

In treating a subject like this it is hard to keep from trespassing upon the subjects of reflex action and so-called vaso-motor system of nerves, a knowledge of which is necessary to the better understanding of this paper.

This paper was passed without discussion, and the second topic, "*Toothache—Causes, Diagnosis and Treatment,*" taken up.

There being no paper on this subject, Dr. Noble was called upon to open the discussion, which he proceeded to do by stating a peculiar case in practice, of recent date, where several teeth were filled, and after a considerable time the patient was taken with very violent pain, paroxysmal in form, in a particular tooth. Not being where the filling could be removed at the time, and as the paroxysms finally subsided, nothing was done, and, up to the present time, all is quiet. He raised the question as to why the pain was paroxysmal, and what was the condition of the pulp at the time?

Dr. Fones: I should call it a case of pulp congestion.

Dr. Noble: I would like to ask Dr. Morgan to state his opinion of what the next stage in developments will be.

Dr. Morgan: I should say that periostitis would be the probable result.

Prof. Shepard being called upon, remarked that the subject was a very broad one, and that it covers a good deal of ground. Stated a case that came into his hands recently, where a bicuspid tooth had been filled on the distal surface with amalgam, a considerable surplus having been left at the cervical point of the cavity, pressing down upon the gum, causing ostitis. Circumstances rendered it necessary to extract the tooth, which was followed by very violent pain, continuing for some ten days. I tried all the remedies that I knew of, but doubt that I did any good. The pain seemed to wear itself out. Have also had a case of the paroxysmal form alluded to, and found it extremely hard to kill the nerve. Afterwards found pulp nodules present.

Dr. Noble: I have noticed lately a peculiar kind of toothache, always imported from malarial districts. Usually the pain will be noticed in sound teeth, and of a recurring type, generally about the same time every day. I call it *malarial toothache.* In every case I have found that the parties had been, or were, subject to chills and fever, and a dose of quinine cures it.

Dr. Parmele stated that he had had several such cases that could be traced to malarial causes.

Dr. Anderson had also had similar experiences in one or two cases of late which yielded to quinine.

Dr. C. S. Hurlbut: In regard to pain following the extraction of teeth, it is known that carbolic acid is a kind of local ænesthesia. I have tried many remedies but have found none so good as a combination of carbolic acid and glycerin, in equal parts, flavored, perhaps, with the oil of cinnamon. I wash out the cavity with this preparation and then press the parts together as much as possible.

Prof. Shepard: I have always made it a practice, and I think it a very good one, to press the edges of the sockets together after extraction. I think it heals more kindly for it. I am reminded of the case of Dr. Stebbins here, who had two contour fillings between the second bicuspid and the first molar. The space between the fillings was left in such shape that foreign matter was forced in between, causing ostitis, resulting in the death of the sceptum, which I removed. After treatment the teeth

came nearer together and the gum grew over the space, so that at the present time it is very comfortable.

Cases in practice were further stated and theories suggested in connection therewith, by Drs. Parmele, Crittenden and others, after which, per request, the Secretary read portions of a paper on "*Diagnosis,*" by Dr. L. C. Ingersoll, of Keokuk, Iowa, published in the September number of the *Dental Register,* which had a special bearing upon this topic.

Voted : That Dr. F. Searle, of Springfield, be invited to prepare a paper on "*Causes, Diagnosis and Treatment of Toothache,*" and present the same before this Society at its next meeting.

Dr. Searle thanked the Society for the honor conferred by this invitation and promised to comply with the request, or, in case he could not do so, to provide a substitute.

Adjourned till 7½ o'clock, P. M.

AMERICAN DENTAL ASSOCIATION.

Third Day.—Morning Session.

(*Continued.*)

Dr. McQuillen favored a medical education—the broadest education for a dentist; but the question was how far it was practicable at this time. The recognition accorded to American dentistry was due to the men in and out of the dental colleges. If universities desired to inaugurate dental departments, they should demand the full course of three years. The future only will show whether the dental departments of medical colleges will afford dental students better opportunities for progress than they can secure in dental colleges.

Dr. L. C. Ingersoll again took the floor, and said dentistry is a speciality of medicine, but the dental profession asked no favors of the medical profession, and had been offered none. Nor did he think a medical graduate qualified to practice dentistry.

After further remarks from one or two gentlemen, Prof. Buckingham moved the previous question.

The question being taken on the motion to adopt the preamble and resolution of Dr. Fillebrown, the same was lost by a vote of 19 to 28.

The discussion was then continued, and Dr. J. N. Crouse made a lively attack on what he termed one-horse dental schools, and said no school should be endorsed which did not provide the full course.

The subject of dental education was now passed.

The Convention then adjourned for the extra session.

The extra session opened at 4 o'clock, with Dr. Rehwinkle in the chair. Dr. Odell, of New York, was made Secretary *pro tem*, but soon surrendered the office upon the arrival of the regular incumbent.

Dr. Weatherbee, moved that the certificate of membership reported by the Corresponding Secretary, be adopted.

Dr. Shepard moved as an amendment that the certificate be adopted provided that the word Honorary was prefixed to that of Member.

An animated discussion ensued, in which it was held that the issuing of a certificate of membership to permanent members would result in some unprincipled person making improper use of it ; also, that men granted the certificate would, in time, fall in arrears, and finally, never put in an appearance ; but that the certificate would be found framed and hung up in their office. That both prudence and judgment demanded that the amendment should prevail seemed to be the prevailing sentiment, although the original motion was ably and earnestly defended by the mover and several others.

Dr. Rehwinkle called Dr. Shepard to the chair, and moved as an amendment, to strike out the words "honorary members," and add the words, "provided that permanent members who have been regular members for five years, and are in good standing, shall, on application to the Secretary and Treasurer of this society, be entitled to the certificate of membership."

Dr. Spalding offered the following as a substitute for the original motion and the amendment to the amendment :

Resolved, That the certificate of membership of this Association shall be conferred on honorary members.

The resolution was declared out of order.

Dr. Rehwinkle withdrew his former amendment, and offered the following as a substitute for the whole question :

Resolved, That this certificate be granted to honorary members, and to all worthy members of this Association, provided they have retained their membership for five consecutive years, upon the payment of $—— the cost of the certificate.

After some further debate the previous question was ordered, and a

vote was taken on the substitute of Dr. Rehwinkle, which was carried by a vote of 18 to 19.

It was then moved by Dr. Crouse to lay the whole matter on the table. Carried. Ayes 30, noes 17.

It was moved that the engraved plate be placed in the possession of the Secretary. Carried. The bill for engraving the plate was ordered paid.

Dr. Rehwinkle having resumed his position as presiding officer, Dr. Spalding offered the following resolution and moved its adoption :

Resolved, That a committee of five, on revision and engrossment of the constitution, be appointed by the chair. In case no new amendments to the constitution are proposed by said committee, they may, at their discretion, cause to be printed five hundred copies of the constitution. This Committee shall report at the earliest practicable time.

Dr. Crouse moved that the matter be referred to the publication committee, with power to act. Lost.

The resolution was then adopted.

Dr. Taft moved that a committee be appointed to draft resolutions concerning the death of Prof. George T. Barker, who was the second Vice-President of the Association.

Dr. Pawls moved, as an amendment, to go into committee of the whole on the subject.

Dr. Crouse moved to lay the amendment on the table, when it was withdrawn by Dr. Pawls.

The original motion was then put and carried.

The chair announced as the Committee, Dr. Taft, of Cincinnati, Dr. Cushing, of Chicago, and Dr. Gorgas, of Baltimore.

On motion of Dr. Shepard, the Publication Committee were instructed to incorporate the constitution in the transactions of the Association.

On motion of Dr. Taft, Prof. Buckingham was added to the Memorial Committee.

The Convention then adjourned until 7.30 P. M.

Thursday evening's session of the Dental Convention opened at eight o'clock, Dr. Rehwinkle in the chair.

The President announced that a telegram had been received from Dr. Dennis, of California, asking that the selection of the next place of meeting be postponed until his arrival.

Dr. Taft, therefore, moved that the selection of the next place of meeting be deferred until Friday morning at ten o'clock.

Dr. Fillebrown moved to lay the motion on the table. Carried.

Dr. Rawls moved a reconsideration of the vote last taken. Lost.

The Nominating Committee reported that Niagara Falls was the only place that had been named for the holding of the next Convention.

Cincinnati, Saratoga, Watkins, Manhattan Beach, Boston, Atlanta and Long Branch were also named by members of the Convention.

On motion, the nominations were closed, and the Convention proceeded to ballot; Doctors Rawls and Black being appointed Tellers.

On motion, it was ordered that after the first ballot all places, except the three receiving the highest number of votes, be dropped. On the first ballot the contest was narrowed down to Niagara Falls, Cincinnati and Saratoga; the two first named having an even number of votes. On the second ballot, out of seventy-five votes, Niagara Falls received thirty-seven, Cincinnati twenty-six, and Saratoga twelve. Saratoga was dropped. On the third ballot, Niagara Falls came out victorious by fifty-eight votes out of seventy-seven.

The election of officers was next in order, and the members of the Convention made choice as follows:

President—Dr. H. J. McKillops, St. Louis.

First Vice-President—Dr. L. D. Shepard, Boston.

Second Vice-President—Dr. L. Carpenter, Atlanta, Ga.

Corresponding Secretary—Dr. A. O. Rawls, Kentucky.

Recording Secretary—Dr. George A. Cushing, Chicago.

Treasurer—Dr. W. H. Goddard, Louisville.

Executive Committee—Drs. C. N. Pierce, G. V. Black, G. W. Keeley.

Fourth Day.

The session opened at ten o'clock A. M.

Therapeutics.—The report of the Committee on Therapeutics being called for, a paper was read by Dr. F. M. Odell, and discussed by Drs. Spalding, Flagg and Atkinson.

Operative Dentistry was the next subject taken up, and a lengthy but carefully prepared and instructive paper was read by Dr. M. H. Webb, and referred to the Committee on Publication.

A second paper, on the same subject, was read by Dr. D. D. Smith, and referred.

Dr. Shepard was called to the chair.

Dr. J. Foster Flagg then read a paper on "Plastic Filling, as a Power in Dentistry," in which he stated that for nearly two years he had not

employed one sheet of gold foil, and had completely abandoned its use. He insisted that for certain kinds of defined teeth, and certain kinds of defined cavities, where it is claimed gold is the best filling, there are other kinds of filling, of a plastic character, that are better than gold.

Dr. McQuillen directed attention to two specimens prepared by Dr. Holloway, of La Porte. He said, in the preparation of specimens, the means used in mounting them too often destroy the normal structure, and have often led to the most erroneous interpretations.

Dr. G. W. Friederichs followed with a paper in which he discussed the asserted necessity of keeping the cavity of a tooth dry during the operation of filling. He cited cases in which he had successfully plugged a tooth with gold under saliva.

Dr. C. S. Stockton read an additional paper, under the head of Operative Dentists, in which he recounted the wisdom drawn from numerous failures of a varied character. At its conclusion, the hour of adjournment having arrived, a recess was taken until half-past three o'clock.

Afternoon Session.

The Association re-assembled at the appointed hour.

The subject of a certificate of membership being taken from the table, Dr. Crouse moved that the design of the certificate submitted be accepted for the use of honorary members, and the words "honorary member" be engraved in the plate.

Dr. Barrett criticized the tabling of the subject on Thursday, as unfair, and said that he thought it unjust, with the slim attendance at this time, to take advantage of the absence of those opposed to the matter, for the purpose of pushing it through,

On motion, it was resolved that a seal for the use of the Association be procured.

Installation of the officers elect was next in order and was carried out in due form.

In vacating his chair, the President, Dr. Rehwinkle, gracefully presented his acknowledgements for the support accorded him by the members of the Convention, and expressed his best wishes for the future welfare and prosperity of the Association. He then introduced the newly elected President, Dr. McKillops, who, upon assuming his position, returned his thanks for the confidence manifested in his ability, by his election to the Presidency. He deemed it a high honor, and,

appreciating the responsibilities of the position, hoped to be able, with the assistance of those who had placed him in the chair, to satisfactorily and properly discharge the duties devolving upon him.

Returning to the regular order of business, the report of the Special Committee on Chemistry was called for.

Dr. CUSHING read a report from Dr. Noel, of Nashville, Tenn. It treated of the destructive action of sugar acids on the teeth, and presented suggestions as to the conclusions to be drawn therefrom. It also discussed and took exceptions to the assertion that sulphuric and nitric acid is generated by the putrification of meats between the teeth, and, in conclusion, took the ground that the greater part of dental decay arises from the decomposition of starchy and saccharine substances in the mouth.

The subject of Chemistry being passed, Dr. C. D. COOK read a report on Dental Literature of recent issue, and criticized the various publications, both foreign and domestic, giving the important questions upon which they treat, and their relation to the profession.

Discussion being in order, remarks were made by Drs. McQuillen and Atkinson.

Dr. SHEPARD moved a suspension of business. Carried.

ORGANIZATION OF SECTIONS.

The various sections were duly organized as follows :

Section I. Artificial Dentistry, Metallurgy and Chemistry— Chairman Dr. Finley Hunt, Washington, D. C. ; Secretary, Dr. C. S. Stockton, Newark, N. J.

Section II. Dental Education—Chairman, Dr. J. N. Crouse, Chicago.

Section III. Dental Literature and Nomenclature—Chairman, Dr. W. H. Atkinson, New York ; Secretary, Dr. J. Taft, Cincinnati.

Section IV. Operative Dentistry—Chairman, Dr. I. J. Weatherbee, Boston ; Secretary, Dr. W. H. Goddard, Louisville, Ky.

Section V. Anatomy, Physiology, Histology, Microscopy and Etiology —Chairman, Dr. M. S. Dean, Chicago ; Secretary, Dr. M. H. Webb, Lancester, Pa.

Section VI. Pathology, Therapeutics and Materia Medica—Chairman, Dr. F. H. Rehwinkle, Chillicothe, O.; Secretary, Dr. William Taft, Cincinnati.

The reception of the report of the Committee on Credentials was received and accepted.

The Special Committee, to whom was referred the amendment to the constitution relative to dental colleges, reported that they did not deem

it expedient to make any such change in the constitution. They offered the following resolution for adoption :

Resolved, That this Association disapprove of the practice of dental colleges in graduating upon less than two full courses of lectures, and believe it to be detrimental to the interests of dental education, and advise the omission of such inducements from their annual announcements.

Dr. SHEPARD moved a reconsideration of the action taken in adopting the resolution of Dr. Spalding providing for the appointment of a Committee on the printing of the by-laws. The resolution was then revised so as to read "that a committee of five on revision and engrossment of the constitution be appointed by the Chair. This Committee shall report at the earliest practicable time." The resolution, as amended, was adopted.

IN MEMORIAM.

The committee appointed to draft resolutions expressive of the sense of the Association on the death of the late Dr. George T. Barker, presented the following, which was adopted :

Whereas, in the wisdom of Divine Providence, our colleague, Prof. George T. Barker, Vice-President of this Association, has been removed by death from our midst, in the prime of his manhood, therefore,

Resolved, That we feel called upon to testify, in this manner, our appreciation of his usefulness as a member of our profession.

Resolved, That we deplore his loss, and regard his example, both professional and social, as eminently worthy of emulation.

Resolved, That the sympathy of the members of this Association be and hereby is tendered to the bereaved family of our lamented brother.

Resolved, That the above testimonial be inserted in the minutes of this Association and printed on a memorial page in the annual transactions.

J. TAFT,
F. J. S. GORGAS,
GEORGE H. CUSHING,
T. L. BUCKINHAM,
Committee.

A vote of thanks was tendered to the retiring officers of the Association, to the *Buffalo Courier*, for its extended and complete reports of the sessions of the Convention, and to the hotels, the railroads and all others, for attentions extended to members of the Association.

The minutes of the session were read and approved, and the Convention then adjourned until 1879.

Explanation.—The recommendation of Dr. Weatherbee, during the discussion on Dental Education, on Thursday, that students study law, theology, etc., should be accepted as being made in an ironical sense. This explanation is made in view of the fact that a number thought he was really in earnest in what he said.

Primitive Dentistry.—Among some of the interesting things seen at the Convention of the American Dental Association, was a set of teeth exhibited by Dr. George R. Friederichs, of New Orleans, which was made in 1825, by Dr. Risseau, of Louisiana. It was an interesting specimen of what dentistry was in its early days. The set was a full one, the teeth being made on a base constructed from a tusk of hippopotamus. The bicuspids and molars were of the same material, the incisors were of the old French make of porcelain, called the French bean, because of their being of one shade in color. They were backed by gold, and fastened to the base by rivets. The upper and lower set were joined together with a spiral spring. It is said they were worn with perfect comfort during the patient's lifetime, a period of thirty years, according to a statement made by a daughter of the lady for whom the teeth were made.

BLEACHING TEETH.

By Geo. H. Cushing.

In addressing you upon this subject, I do not expect to tell you anything new, nor do I assume to understand it theoretically. I only speak to you upon it at all, because of a seeming desire on the part of some to have the subject presented. It is always desirable that professional men should understand the principles involved in governing any of the processes or methods of practice pursued by them, as thereby more intelligent, and consequently more successful modes are likely to be followed. In endeavoring to lay before you the principles governing the process of bleaching, I shall only give you the words of eminent authors on the subject, whom I have been able to consult.

The facts, scientifically considered, concerning this process, seem to be but imperfectly understood, and there has, as yet, been no positive conclusion arrived at concerning the chemical changes which take place.

Ure says, under the head of "bleaching":

"The true theory of bleaching has not been entirely agreed upon, but there can be little doubt of the principal operations.

"It is known that oxygen deprives substances of color; this may be performed by many high oxides; by nitric acid, manganic and chromic acids and chlorous acid. The same effect may be produced by chlorine, bromine and iodine."

The new Encyclopedia of Chemistry, regarded as one of the best works of the present day, says, under the head of "bleaching":

"Modern writers seem to agree that the principal action which takes place during croft bleaching (*i. e.* bleaching fabrics on the grass) is the combination of the oxygen of the air with the coloring matter, resulting in a compound which can be dissolved out by water or alkaline liquors, or boiling."

From the same work, under the head of "chlorine," we find:

"Chlorine acts powerfully upon all vegetable and animal substances, and its action consists in combining with some (or sometimes the whole), of the hydrogen, which is a *never* absent constituent of all animal and vegetable tissues. Upon this property of chlorine rests its application in bleaching."

"Chlorine may be obtained by heating aqueous hydrochloric acid with peroxide of manganese."

From Wagner's Technology, under the head of "chlorine," we find:

"The bleaching property of chlorine gas, possessed also by its solution, is due to the great affinity of chlorine for hydrogen, so that the chlorine when seizing upon the hydrogen of the organic body, in most instances, causes the simultaneous decomposition of water, and by the formation of ozone destroys the organic coloring matter; hydrochloric acid being at the same formed."

From the same, under the head of "sulphurous acid," we find:

"The bleaching property of sulphurous acid may be considered as due to two entirely different causes. In some instances the pigment is only masked—not destroyed. Sulphurous acid enters with some pigments into a colorless combination; in other instances, however, a real decomposition of the pigment takes place. The former condition obtains with most of the blue and red flowers and fruits; a red rose bleached by sulphurous acid, has its color restored by immersion in very dilute sulphuric acid. The pigments of yellow flowers are not

affected by sulphurous acid ; it also does not at first act upon indigo and carmine, and the yellow color of raw silk ; but, by the combined and continued action of this acid and direct sunlight, the oxygen of the acid acts as ozone and determines the bleaching."

From Brande & Taylor's Chemistry, under the head of "chlorine," we find :

"The bleaching agency is explained by the evolution of nascent oxygen, resulting from the decomposition of aqueous vapor or water."

I might quote to you, indefinitely, from various authors who hold the same general and yet somewhat diverse opinions as to the precise action which determines the bleaching. One author thinks it very probable, that in all bleaching, by whatever intermediate agent brought about, the active influence is always ozone or nascent oxygen. Others, again, lay great stress upon the influence of the actinic ray.

Thus, I have endeavored to place before you briefly, all that is at present known, theoretically, upon this subject, and I think it may be of service to some who may hear me who have not studied this subject, as giving some scientific ground upon which to base hopes of success. I know that some persons are very skeptical regarding the possibility of bleaching badly discolored teeth, and I am sure the skepticism is sometimes due to the want of knowledge of the principles governing the process. Of course, the matter of greatest interest to us is, how to do it ; the practical treatment is most anxiously sought for, rather than the theoretical doctrines, and I will endeavor to state what I know about the matter, so that any person, if disposed, may treat such cases with reasonable prospect of success.

It would be well, probably, in treating of the practical aspect of the subject, to consider : First, the cause of discoloration and the character of the pigment we are to destroy. Second, the character of the tissue we have to bleach ; and finally, the agents and the method of employing them, best adapted to secure the most successful results.

First, then, as to the cause of discoloration. It may be stated, I think, as the general opinion, that the discoloration which follows the death of the pulp of the tooth, arises from the hæmatin or coloring principle of the blood. As to how that becomes lodged in the dental tubes, I confess myself unable to state, and I do not remember to have read of any explanation of the process. My own impression is, that the red blood, as a rule, does not penetrate the dental tubuli, only the liquor sanguinis, and I am not aware that that carries the hæmatin. I suspect

but little can be known as to this point, and my own judgment leads me to the conclusion that the coloring matter is not carried into the tubuli from the blood, but that the change of color takes place by reason (perhaps) of the oxydation of the contents of the tubuli, which are left there cut off from the usual nutriment after the destruction of the pulp, and which must undergo certain physical changes, although it is impossible for us to say what. There is but one other frequent source of discoloration that I am aware of, and that is from the oxydation of amalgam in the filled cavity.

Second, as to the character of the tissue we have to bleach, I need hardly go into any detailed statement of the general characteristics of dentine. Briefly, it may be stated that we have to operate upon a more or less dense material, which holds within its tubuli the offensive pigment, and that in proportion as the dentine is soft or porous, will be the success attending our attempts to bleach.

I know that many persons say: "I don't see how it is possible to bleach so dense a structure as that of the dentine, under the unfavorable conditions surrounding its treatment in the mouth;" and many do not believe that the bleaching material can penetrate deep enough to do any good. It must be remembered that however dense the structure, it is permeated throughout with moisture, and that wherever the moisture is, the *chlorine*, if that is the agent used, can reach in process of time. The strong affinities between the chlorine and the hydrogen of the moist tissue overcome barriers that would seem almost insurmountable. With teeth not dense, we see the operation of the bleaching agent sometimes instantly, while in those of very hard and close texture, its operation may not be observed for a long time.

Finally, as to the agents and methods of employing them. The agent that in my own experience is most to be relied upon, is chlorine; and I think it is the one most generally employed. In a very large majority of cases, it will be found to be all sufficient, or at least, more efficient than any other agent. Still there are some cases in which nitric acid may be employed to better advantage than the chlorine; many other agents have been suggested, such as oxalic acid, peroxide of hydrogen, and some others. I have, personally, no knowledge of the action of any agent, except chlorine, nitric acid and peroxide of hydrogen; and of the latter only from one trial, in which it failed to act promptly, and I performed the bleaching with chlorine. Nor am I aware of any success that has attended the use of any agents, other than

the chlorine and nitric acid, that would place them higher in value than others. That it would be desirable to find some agent more powerful than these, is certainly true, as in a few cases we fail to secure as good results as we desire with any agent now practically known in this connection. Perhaps the suggestions thrown out in this paper, may stimulate some of you to the research and experiment which will bring us the desired article.

Nitric acid has been suggested as particularly indicated where the discoloration is due to the presence of metallic oxides. Theoretically, this is undoubtedly correct, and probably would be practically, but as I be fore remarked, it is impossible sometimes to determine whether such oxides are the cause of the trouble, and in many cases where we do not think the discoloration due to metallic oxides, still the nitric acid bleaches more thoroughly than the chlorine. It can only be determined by experiment, whether it is better or not, and in cases where the chlorine does not accomplish as much as we desire, the nitric acid may very properly be tried.

Now, as to the mode of applying these agents and the general treatment of such cases :

The rubber dam should be applied and the discolored dentine cut away as extensively as is consistent with the strength of the tooth. If chlorine is to be used, the preparation known as Labarracque's solution of chloride of soda, or of lime, is probably the best that can be employed. Pure chlorine gas has been used, but I believe the testimony of those who have tried it, does not warrant its recommendation over the solution just named. When the cavity is thoroughly excavated, a small pellet of cotton should be dipped in the solution and then touched to little powered alum and immediately applied to the cavity and allowed to remain there for ten or fifteen minutes. The cavity should then be washed out and dried, and the application repeated, and repeated as often as may be necessary to secure the best results. The alum is used simply because the chemical action which takes place, liberates free chlorine, which is then nascent and acts more powerfully and rapidly than it otherwise would in the solution alone. It may be necessary to repeat this treatment at two or three sittings, pursuing it for from one to two hours at each sitting. In the majority of cases, this treatment will secure very satisfactory results. When the tooth is ready for filling, it may be lined upon its labial side, with oxychloride of zinc, if desired, which will, in some cases, aid greatly in restoring the natural color.

Where nitric acid is used, it may be applied in the same way on a small pellet of cotton, but should not be left so long—only from two to five minutes—and, after the bleaching is finished, for any sitting, the cavity should be thoroughly washed and rewashed with a solution of bicarbonate of soda, or some other alkali, to thoroughly neutralize any acid which might remain in the tooth.

In the use of the peroxide of hydrogen, it is applied in the same way upon a bit of cotton; but I have not much hope, from my own experiment, that it will prove any better, or as good as the chlorine.

This, I believe, covers the entire ground of the methods of treatment. They are very simple, and all that is needed to ensure success, is faith and patience. We should not give up, because we fail to get the results we want in a minute, or an hour, but persist until we have demonstrated that no more can be accomplished, and then accept the result, whatever it may be—like philosophers.

Now, after all has been done, as above described, you will sometimes fail to secure as good results as you hoped for. There are some cases that apparently will not yield to treatment beyond a certain point, and some few that are but little improved; but very few, indeed, that cannot be improved somewhat, and most of them almost restored to their natural color. In some cases, again, you will find the main part of the tooth fully (or nearly so) restored, while at the margin of the gum the tooth will present a quite dark line still that cannot be lightened by any prolonged treatment. Why this is so, I do not pretend to say, I only state the fact.

A word should be said, before closing the subject, upon the effect which these agents may have upon the integrity of the tooth structure. Many people believe that a tooth cannot be bleached, except at the expense of its strength and durability. Theoretically, this is doubtless true, but practically, I am sure it is not. I am certain that I have never seen any destructive effect of any of the agents named, even from the most prolonged and repeated bleachings, and no man need feel any anxiety in that regard if he uses his agents properly and allows himself to be guided by common sense. The purpose of this paper will have been secured if it shall render clear to even one of you, to whom it was previously dark, the subject of which it treats, and I close with the hope that some may be induced to try this treatment who have not heretofore pursued it.—*From Transactions of the Illinois State Dental Society.*

EXTRACT FROM PAPER READ BEFORE THE N. Y. NEUROLOGICAL SOCIETY—NEURALGIA FROM DEPOSITS IN THE PULP CHAMBER.

By D. H. Goodwillie, M.D., D.D.S.

F. G., aged 41 years, sent to me by Prof. F. H. Hamilton, in June, 1870, has had neuralgia of the right side of the face for the past twenty years. It was contracted by exposure to wet and cold in the gold mines of California. It has gradually increased until now the paroxysms appear about every five minutes. He is well developed physically, and has always been healthy until the present trouble supervened. But he now presents a most woeful appearance from his long and constant suffering.

The pain has been somewhat changeable. At first it appeared in the inferior dental at its exit upon the face, at the mental foramen, and forward to the center of the chin. A section of this nerve was made twelve and seven years ago, with only temporary relief.

He now suffers very much from the infra and supra-orbital nerves—the former, particularly. During his paroxysms of pain he has lachrymation and salivation ; and, in the middle of a sentence, while speaking, he is obliged to stop short until it has passed away. He has taken all the known remedies for neuralgia ; yet it has steadily increased. He is willing to submit to any treatment to obtain relief from his great trouble.—No history was given of hereditary neuralgia, rheumatism or gout.

The mouth was examined, and all the teeth remained except a few of the back molars. The remaining teeth were all sound with the exception of a very small decay in two superior molars which were filled and could cause no trouble. From my past experience in these cases, I was led to suspect that there were deposits in the dental pulps. A few teeth were extracted, and when the teeth were split open, osteo-dentine deposits were found enclosed in the vessels of the pulp. All the remaining teeth were extracted ; and a section being made deposits were found either in the pulp chamber or in the nerve canal. In some of these teeth presented, will be seen large and small osteo-dentine granules in the substance of the pulp. In the canal of the roots will be seen also a narrowing of the canal by deposits to the walls.

As these calcified masses formed, the vessels of the pulp were encroached upon, and strangulated, and the pressure on the nerves caused severe pain.

In some of the teeth it will be seen that the dental pulp was entirely cut off in the fangs by deposit in the canals.

This patient remained under observation for some time before he returned to his home, and up to that time appeared entirely relieved from his suffering, since which time I have not heard from him. I cannot say that the prognosis will be entirely favorable in this case.

It being of long standing—the patient apparently in the decline of life—pathological changes in the structure of the nerve tissue may have taken place. The lachrymation and salivation is an unfavorable feature in the case, as it shows that he is suffering from secondary affection of the glands.

Whether these deposits in the tissue of the pulp are the true cause of his neuralgia, or a consequent in this case, is difficult to decide. Certain it is, that it has been a source of intense suffering.—*Amer. Jour. of Dental Science.*

NOTES.

The Late Thomas H. Powers.

Mr. Thomas H. Powers of the well-known firm of Powers & Weightman, of Philadelphia, manufacturers of chemicals, died of pneumonia at his residence in this city, on Wednesday, the 20th of November, in the 67th year of his age. His illness was very brief, as he was at the office of the laboratory in the city on the Saturday morning (16th) previous to his death, and I am informed that up to 10:30 of the evening of Tuesday, strong hopes were entertained for his recovery. Even on the morning of Wednesday he was apparently as well as the day before; conversing freely with his family to within a few moments of the close of his life.

Mr. Powers early evinced a fondness for chemical pursuits, and was placed by his relatives in the store of Smith & Hodgson,* predecessors of the present house of Bullock & Crenshaw. About this time he graduated from the College of Pharmacy, and having served his term of apprenticeship, was admitted to the firm, although his name did not appear. In 1836, John Farr, an Englishman, who had, in connection with a Swiss gentle-

* Both of whom are now living.

man, named Kunzi, established chemical works in Philadelphia on a small scale, some eighteen years previously, made his acquaintance through their connection with the Episcopal church.

This acquaintance resulted in the formation of a new firm in 1838, Mr. Kunzi having retired in 1836, Mr. Farr associating with him Mr. Powers and William Weightman, under the firm name of John Farr & Co., which three years subsequently was changed to Farr, Powers & Weightman, and in 1847 to Powers & Weightman.

The Philadelphia *Ledger* thus speaks of his business career, and expresses facts well known at his home:

"The history of this firm is the history of the growth of chemical manufactures in America. Commencing in a small way at Fourth and Coats Streets, Messrs. Farr & Kunzi devoted themselves principally to the manufacture of quinine. After the formation of the new firm, the manufacture of morphia was also commenced, and upon these two important staples its great business has been reared, until now its business outranks in magnitude any similar concern in America, and is not surpassed by any in the world; indeed, in the number of different chemicals prepared at its works at Ninth and Parrish Streets and its other great establishment at the Falls of Schuykill, it surpasses all others.

"In the composition of this firm Mr. Farr, himself an accomplished chemist, assigned Mr. Weightman, just then returned from his studies in Europe, to the chemical department, and Mr. Powers to the commercial, for which he was eminently constituted. While with Smith & Hodgson he had foreseen the important part which the newly introduced medicine, morphia, was to play in medicine, and had urged on that firm the great advantage to them of commencing its manufacture, demonstrating by his own experiments that it could be produced at a profit. When he assumed his new relations, his desire was accomplished, and the manufacture of morphia became only second in extent and value to that of quinine.

"In the hands of this firm the manufacture of these articles was much simplified, and in the case of quinine, so much more economically conducted, that the price of that drug was very materially reduced. In late years the manufacture of quinine has been supplemented by the production of several alkaloids of like character, and one of these, cinchonidia especially, Mr. Powers was mainly instrumental in introducing to the medical profession, supplying them with the article gratuitously, and sending with the medicine a pamphlet containing necessary information.

"In April, 1865, the firm of Powers & Weightman, established an office in New York City, the present location of which is 56 Maiden Lane. The magnitude of their operations is so well known that it is useless to detail them. At the Falls of Schuylkill the firm own seventy acres, ten or twelve of which are occupied by the laboratory buildings. The city laboratory is a monstrous structure, and has in its proximity three storehouses, which are also very large.

"In looking over the characteristic traits of Mr. Powers' character, the one which stands out boldly, and which, without doubt, made him so successful in every enterprise, whether in business or charitable pursuits, was his wonderful penetration and foresight. His fondness and aptitude for details was remarkable. When a new matter was presented, he instinctively grasped the subject in its entirety, specifying all the elements of success, and pointing out the principal obstacles to its accomplishment. And

this was true, not only as to the details of the immense business which he conducted, but applies as well to the needs of the poorest of the objects of his almost boundless charity.

"Many facts might be cited illustrative of this ruling trait, the most recent being the sending to Atlantic City in detachments the five hundred young women employed in the works, at his individual expense, an account of which was recently published. His object, to give them a week of unalloyed enjoyment, was accomplished by anticipating almost every desire which comfort or fancy might create, and supplying the article itself. To say that such a man is mourned by the hundreds of employees of that great establishment, to each of whom he was like a father, would not express the sorrow felt by hundreds of families on the announcement of his unexpected death.

"Nor is that sorrow confined to those connected by business relations with him; the circle of his charities was so wide that it is hard to say where his loss will not be felt. Like the dew his charity fell on everything deserving it, and like the dew it fell silently; the giver and the recipient were in very many instances the sole keepers of the secret, while many received, not knowing to whom they were indebted. A peculiarity of his giving was that the recipient was not made to feel the obligation; nay, to feel that he was deserving of it. And, where it lay in his power, he would put the recipient of his bounty in a way to help himself. How much of his fortune was expended in this way no one, probably not even himself, ever knew."

An instance of his sense of delicacy (in bestowing gifts) came under my own knowledge. Some years since, one of a number of schools which were chartered in the early settlement of Pennsylvania under title of Charity Schools, and are still maintained to some extent by individual aid, asked for assistance. In his response he said, "Tear down the name of 'charity' school from your walls, erase it from the school books, do not keep it before the eyes of those children, making them believe that they are objects of charity, when they are no more so than the millionaire's son who is sent to the princely endowed colleges of our land, and I will give———(a handsome sum) and remember it in future.

He was a man of strong religious convictions, and "his business and his religion went hand in hand; they were not antagonistic at any point, and perhaps one great element of his business success was his determination from the start to make one subserve the other. This may, perhaps, be illustrated by reference to the action of his house during the late yellow-fever epidemic, which caused a sudden and great demand for quinine. The importers of that necessary drug at once advanced the price a dollar and a dollar and a half an ounce. Mr. Powers, on the other hand, and on all similar occasions, declined to sell quinine to speculative purchasers, but furnished to his old customers at the old rates; and it may be said generally that no hope of gain ever tempted him to take advantage of a public necessity. His business manager stated that, in a conversation very recently, Mr. Powers said, 'I believe it my duty to provide work for the poor in this time of general distress, and, therefore, I build, although I might find more lucrative investments for my money.' Thousands of workmen were thus benefited by this noble-hearted man.

"It is well known in this city that the Reformed Episcopal Church is largely indebted for its advancement to the wealth which he so freely bestowed to secure its prosperity. Always a low-churchman, he

espoused the cause of Bishop Cummins at once when he came out from the Protestant Episcopal Church. He attended the first convention of the new church in New York, and took a leading part in the debates which led to the establishment of that denomination. He was one of the movers, if not the first mover, in organizing that denomination in this city, and, for some time, the vestry meetings were held at his house. He expended large sums yearly in publishing religious works for free distribution, and many a young clergyman in both churches has been supplied by him with a fine reference library.

"Always a free giver in the old church, his contributions to the new were many and large. The beautiful edifice of the Second Reformed Episcopal Church, at Twenty-first and Chestnut, over which Bishop Nicholson presides, and of which Mr. Powers was a member, was built by him as a free gift to that church. He also built the chapel at Sixteenth and Oxford, and, in great part, the chapels at Frankford Road and Sepviva street, and those in Frankford and Germantown, and the one at Falls of Schuylkill. He also contributed largely to build a great majority of the eighty or ninety churches of the new denomination scattered through the country, South, West, and even in Canada. The *Episcopal Recorder*, the organ of the church, is an individual enterprise, productive of much good, but from which no revenue is derived; it, like his other publications, being but one of the many means in his hand for advancing the church's interests. While the loss of such a supporter must be immediately and seriously felt, he has done so much to establish it that no fears are felt for its future success.

"Not only in church edifices has Mr. Powers enriched our city, but he has beautified it with many beautiful dwellings, notably those in the immediate vicinity of the Second Reformed Church, at Twenty-first and Chestnut, on both sides of Chestnut, and on Twenty-first street, at Forty-first and Forty-fourth and Forty-fifth and Chestnut, and in many other parts of the city.

"Though connected with and contributing to many public charities, he was more immediately concerned in the Howard Hospital, and with the charitable trusts controlled by the Girard Trust, of which he was a director. He was also one of the Board of Prison Inspectors, and was instrumental, during his long service on that Board, in bringing about many needed reforms in prison discipline. He was a director of the Commercial National Bank, and was punctual in his attendance to the duties of all these positions. In fact, it may be said that one secret of his ability to accomplish so much work, so varied in character, was that he had an appointed time for everything. He had gathered around him capable men, whom he could trust to carry out his wishes—men trained up in an atmosphere of devotion to business and principle, and who were devoted to him."

The deceased was a man of rather remarkable personal appearance, and bore a striking likeness to the late Horace Greeley. Of late years he was very venerable in appearance, and was one who would be noted anywhere as a man of remarkable ability. His capacity as a business man was gigantic; and, notwithstanding the various religious and charitable objects to which he gave his time and means, he still continued to push his own business with remarkable energy.

He leaves a very large estate, the principal being estimated at several millions of dollars. A wife and one daughter survive him. Always prepared for the event in business, so death found him ready. His life had been all peace, and death was without a struggle.

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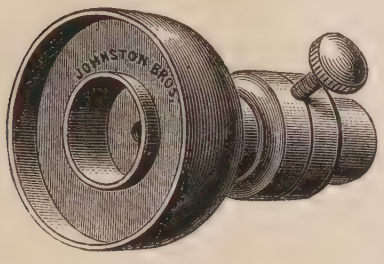
The SHANNON DISK MOUNTER enables one to do well with the greatest rapidity, what before has been done imperfectly and slowly by such dentists as have essayed the task at all. The directions are simple enough. To mount an "Arthur" or other disk so that it will be perfectly true on its mandrel: Take a screw mandrel or an old bur, warm the end which is to be bedded in the corundum over a spirit lamp, then pass it through the center of the disk; then, while still warm, pass the mandrel into the large end of the mounter, and press the disk on to it, having the face of the disk held firmly against the face of the mounter until it cools, and so is fastened—when it will be found to be true.



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IRIDIUM PLATINA NERVE BROACHES.

They possess the following advantages:

They do not corode in the slightest degree, even when exposed to moisture, acids, iodine, or other medicines.

They can be cleansed perfectly from diseased matter, which gets on them when used to extract dead nerves, or from traces of medicines used in treating diseased teeth, by heating to redness in the flame of a spirit lamp.

Price, per package ($\frac{1}{2}$ dozen)..... $1 50

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JOHNSTON BROS,

1260 Broadway, N. Y.

Wilkerson Dental Chair.

PATENTED NOV. 20, 1877.

PRICE $175.

The cut is a good representation of this unique chair. The acknowledged requirements of a first-class dental chair have been here secured by Dr. M. B. Wilkerson—the inventor—by methods showing great originality. All cranks are dispensed with and levers substituted for them. The chair is raised by pressure of the foot on the long lever, which hides the back foot in the cut. This operation requires very little effort, and occupies but eight seconds, and is only equivalent to stepping up eight steps. To lower the chair one has only, with the toe of his boot, to raise the lever just back of that first named, and the chair sinks rapidly and noiselessly until the lever is dropped, when it instantly stops. Except when in use the long lever folds in under the chair.

A touch of the lever in front of that just named, leaves the chair free to rotate through the whole circle. Directly beneath the seat of the chair, and close to the seat, is shown a lever, which, when pressed forward, permits the rocking movement while the lever is held, but whenever released fastens the chair in position.

Thus the three principal movements, elevation, rocking and rotation, are accomplished. The minor movements, all of great importance, however, are the raising or lowering of the back of the chair; the raising in like manner of the head-rest; the slight rocking of the seat of the chair, so as to prevent the patient from sliding forward; the adjustment of the footstool at various lengths and heights; the spring back support to rest the small of the back. This, at will, is converted into a capital child's seat.

An arm-rest is shown at the right of the head-rest. It can be secured on either side of the head-rest at will.

The whole chair is of the most substantial construction and highly ornamental. It will be upholstered in either green or garnet plush or in leather.

This is *not* an hydraulic chair. It has *no pump*, but is raised simply and solely by a lever actuated by the foot. When raised, the elevation of the central column, which supports the chair, tends to produce a vacuum in the chamber through which it passes, and this chamber is immediately filled by a column of oil, which, opening a valve at the bottom of the chamber and directly following up the central column of the chair, blocks it up whenever the lever ceases to raise it higher. Of course, whenever the same valve is tripped, the oil flows back into its receptacle, and the chair is rapidly and noiselessly lowered. *Not one drop of oil* has ever or can ever find egress from the inner base of the chair to its exterior. So much to silence constant misrepresentations of another dealer.

ADVANTAGES.

1st. It can be raised with the foot of the operator, and by a very slight effort.

2d. It can be raised in half the time of any other dental chair, except the Morrison.

3d. It can be lowered without exertion of force, and as much or as little, or as fast or as slow, as desired, by merely opening a valve.

4th. Its range of movement is superior.

5th. It has a perfect forward and backward movement, so that the patient can be rapidly inclined at any angle by a very slight exertion of force by the hand.

6th. Its arrangement for children is unique and excellent.

7th. Its footstool is readily adapted to the wants of large or small persons.

8th. Its head-rest is completely firm in any position in which it may be placed, has a large range, and is fastened by a single movement of the hand.

9th. The operator can control all its movements without once taking his hand from the mouth of the patient.

10th. It has a perfect rotary movement.

11th. By means of an adjustable foot it will stand firmly on any floor, however uneven.

We have orders for a large number, and are receiving more daily, and entering them in rotation.

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The Morrison Dental Chair.

Comfort for both Operator and Patient, Rapid Movement, Simplicity of Construction, Great Durability.

The desirable features of a dental chair are almost completely enumerated above. The Morrison Chair answers each of these requirements more completely than any other chair made.

It contributes to the ease of the operator:

1st. By the lightness and rapidity with which the patient is raised or lowered to a convenient position.

2nd. By the form of its back, which is so narrow as to render it unnecessary for the operator to stretch to reach his patient.

3d. By permitting him to drop either arm of the chair entirely out of his way.

4th. By making it possible to operate in either a standing or sitting posture with equal facility.

It affords comfort to the patient:

1st. In the arrangement by which the lower back-pad may be moved forward to support the small of the patient's back.

2nd. The upper back-pad is readily raised or lowered, so as to exactly adapt itself to the wishes of any patient as if the chair had been made for this one person.

3d. By the readiness with which the patient may change the foot-stool from one position to another as suits their notion at the moment, and without disturbing the operator.

If desired this chair can be furnished with either the usual upholstery of dental chairs, or with Turkish upholstery—soft and with springs; or with summer seats and back—of cane; or with separate sets of all of these, which can be changed from season to season by the owner without difficulty or the necessity of employing mechanics of any kind.

Its movements are very rapid.

It can be raised from its lowest position, in which the seat is 15 inches from the floor, to its highest, 42 inches above the floor, in seven seconds. Both low

and high based chairs are here combined in one, giving a vertical range of more than two feet.

It has no equal in operations upon Children.

The child can be raised as high as needed by the tallest operator.

It is provided with a comfortable back and head-rest, exactly as is a grown person.

The foot-stool is quickly adapted to children of any size.

It is extremely simple.

The principal movements of the chair and head-rest are all under control of but three clamps, and the chair is adjusted in height by a single crank.

By one of the above-mentioned clamps it is securely fastened at any desired inclination, and all done in an instant.

It is very durable, because

1. Being made almost entirely of metal, open joints or season cracks are impossible.

2. The upholstery of this chair is so arranged that it can be renewed, by exchange of the upholstered parts, without leaving the rooms of the operator and at moderate expense.

ACCESSORIES.

CASTORS.—To secure the *rotary movement* for such persons as desire it, legs have been cast, having recesses in the feet, into which Castors are inserted. The castors in the front legs roll laterally only, so that by them the patient's face may be turned to the light. When in the right position a locking device permits you to fasten the castors so that they cannot be moved until unlocked. The castors in the back feet are so placed as to revolve only back and forward, so that while they permit you to easily roll the chair like a wheelbarrow out of position if you wish to sweep, they cannot be moved by the force exerted in plugging a tooth.

NARROW BACK PAD.—To be used sometimes instead of the top pad, and sometimes as a third pad when the back of the chair is stretched to full length.

SPITTOON ATTACHMENT—see in the cut—is a cheap and convenient substitute for a separate spittoon. Is more convenient and costs less.

HEAD-REST.—The Morrison Head-Rest is a *thoroughly* good one, and has given general satisfaction. It is supplied with the chair if we are not otherwise directed, and the price of the chair as named includes this rest. The Johnston Head-Rest is *our latest*, and is everywhere approved. It can be had with the chair at an extra cost of $8.00. It is shown in the cuts.

EXTRA UPHOLSTERY.

Turkish Upholstery.

Some persons having desired a softer style of upholstery than is usual in dental chairs, we have adopted, after many experiments, a modification of what is usually known as the Turkish chair. The seat is made about four inches higher in front than at the back, and both it and the lower back are made very soft by the liberal use of steel springs and hair, the edges being kept full by a piece of heavy spring wire which is built into the upholstery.

The perpendicular edges are covered with a puffing to match, and "set off" with handsome silk cord.

The arms and upper back pads are made heavier than usual, and are puffed and corded to match the seat.

Real Morocco.

We also have produced a very elegant article by the use of real morocco, handsomely embossed. It is durable and particularly desirable for warm climates.

PRICES.

In fine green or garnet plush—with Morrison Head-rest	$ 150.00
Boxing	5.00
To which price add, if ordered:	
With Castors	10.00
With Johnston Head-rest, instead of Morrison	8.00
With extra back-pad	4.50
With spittoon attachment and porcelain cuspador	8.00
With nickled metallic cuspador and gold trap	10.00
With nickled metallic cuspador and gold trap, and nickled spittoon attachment	18.00
With Turkish upholstery	15.00
Real morocco embossed	10.00

COMBINATION WILKERSON CHAIR ATTACHMENTS.

STYLE 1.—As shown in cut, including nickel plated spittoon, with gold trap, and Allan bracket table, also with nickel plated tumbler holder..... $40 00

This table of walnut, handsomely ornamented with French walnut, is fourteen inches square and three inches deep. It has one drawer, fitted for about one gross of engine instruments; two drawers adapted for gold preparations, and two for filling instruments.

STYLE 2.—Same as above, with a porcelain cuspador instead of the nickel plated spittoon..... $32 00

STYLE 3.—Same as style 1, except with Morrison bracket table instead of Allan table..... $32 00

STYLE 4.—Same as style 1, except with Morrison table and porcelain cuspador, instead of Allan table and nickel plated spittoon..... $24 00

STYLE 5.—Same as style 1, less spittoon and fork, and tumbler holder..... $25 00

STYLE 6.—Same as style 1, but with Morrison table instead of Allan table, and less spitton, fork, and tumbler holder..... $17 00

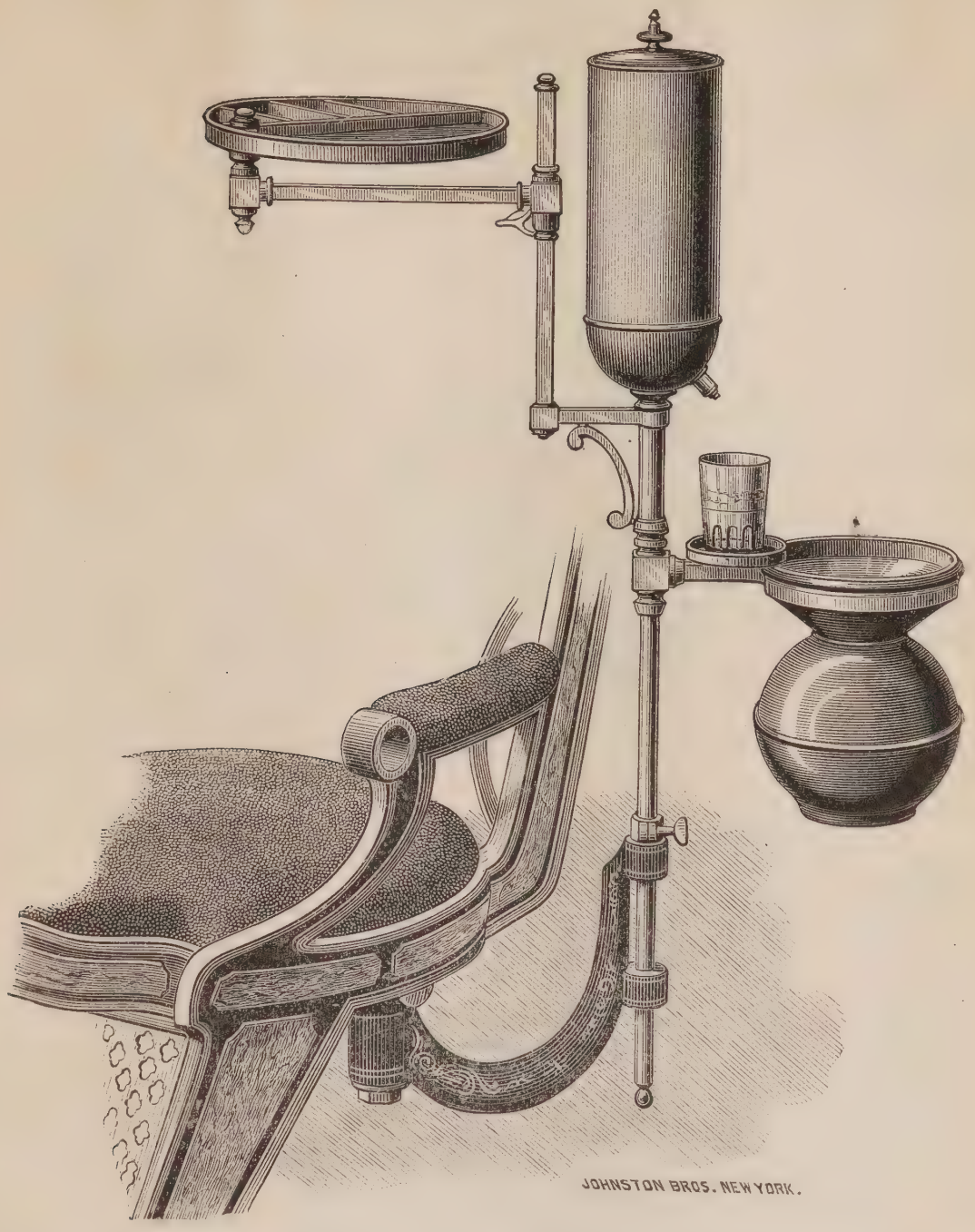
STYLE 7.—Attachment and nickel plated spittoon and glass holder (no bracket) $25 00

STYLE 8.—Same as style 7, except with porcelain cuspador instead of nickel.. $17 00

NOTE.—We can supply a few very fine rosewood bracket tables—Morrison style—fourteen inches square and one inch deep, at four dollars each above the price with Morrison walnut table, or four dollars less than where the Allan table is supplied.

JOHNSTON BROS., N. Y.

WILKERSON RESERVOIR SPITTOON—AND BRACKET.



This attachment to the Wilkinson Dental Chair is designed to satisfy a want long felt by those of the profession who are so situated that a supply of running water is not readily obtained.

By reference to the illustration accompanying this advertisement it will be seen that a Reservoir of water is supported above the Cuspador, upon a nickel plated column, which in turn is held firmly by a japanned arm which swings freely from the side of the chair. It is very strong, and imparts its own steadiness to the whole apparatus. The plated column is adjustable vertically, and can be secured at any height as compared with the chair that may suit the requirements of the operator. By simply lifting the rod that projects through the centre of the cap of the Reservoir a valve in the bottom of the Reservoir is opened and a gush of water is permitted to pass to the Cuspador, the funnel of which is so constructed that its whole surface is flushed and rinsed by the water. The capacity of the Reservoir is sufficient to rinse the Cuspador twenty times. The attachment of the Cuspador is such that it is readily removed when it is desirable to empty it. It is provided with a gold trap of the latest and most improved form. A glass and faucet for drawing water from the Reservoir is provided.

The bracket table is so constructed that it can be raised and lowered by one hand, and is so mounted on the post that it can be placed in any position the operator may desire. *The whole attachment is highly finished and handsomely nickel plated.*

Price..... $50 00

JOHNSTON BROS.,

1260 Broadway, N. Y.

LIQUID NITROUS OXIDE.

N O

No other equally safe anæsthetic is known. While Chloroform and Ether are killing scores, if not hundreds, annually, Nitrous Oxide, although used many times as frequently as either of the other anæsthetics named, proves itself entirely harmless; and this too, though very commonly an impure article of Nitrous Oxide is exhibited. The Nitrate of Ammonia ordinarily furnished in the market is far from being chemically pure, and the products of its decomposition are too often impure Nitrous Oxide and Bin-oxide of Nitrogen. The latter is a gas of which the chemist, Brande, says:—"It is rapidly fatal to animals"—and again, (of the reddish fumes which result from its admixture with air, which fumes most dentists have seen while making Nitrous Oxide,) "These are fumes of Nitrous Acid, ($NO^2+2O=NO^4$). They have a peculiar suffocating odor, and are highly irritating and corrosive—*care should be taken that they are not breathed, even in a dilute state.*" All danger from this source may be avoided, however, by making use of *Liquid* Nitrous Oxide, which, being prepared constantly and in large quantities, under the direct supervision of a chemist, is certain to be pure. *No instance* of fatal results following the administration of pure Liquid Nitrous Oxide Gas is known. The following statistics, showing the comparative safety of several of the leading anæsthetics, have been before given by us, but cannot be too often brought to the notice of those who are constantly called upon to relieve suffering by means of these agents.

From a careful examination of the statistics of 200,893 cases, Prof. E. Andrews gives, in the *Chicago Medical Examiner*, the following estimate of the relative danger from different anæsthetics:

Sulphuric Ether	1 death to	23,204	administrations.	
Chloroform	1 "	2,723	"	
Mixed Chloroform and Ether	1 "	5,588	"	
Bi-chloride of Methylene	1 "	7,000	"	
NITROUS OXIDE	**no Deaths in**	**75,000**	"	

Edward R. Squibb, M.D., than whom our country has no more able pharmaceutist and toxicologist, in a lecture on anæsthetics before the Medical Society of the State of New York, says: "Nitrous Oxide was the first anæsthetic; and the safety and certainty of its effects, even in inexperienced hands, for all momentary operations, and the promptness with which persons recover from its use, render it perhaps the most important of all anæsthetics, because destined to relieve a greater aggregate amount of pain, *with greater safety*, than any other agent."

Again—"If the surgeon considers the safety and saving of pain to his patient, first, and his own convenience in operating, second, he will hesitate before passing over such an agent as Nitrous Oxide."

It may be well just here to call attention to the fact that, when ether or chloroform is administered, it is not at all uncommon for the air about the patient to become so charged with the vapor as to somewhat affect the surgeon, taking from him perfect clearness of mental operation, and of the senses, and frequently leaving him with headache, and even nausea.

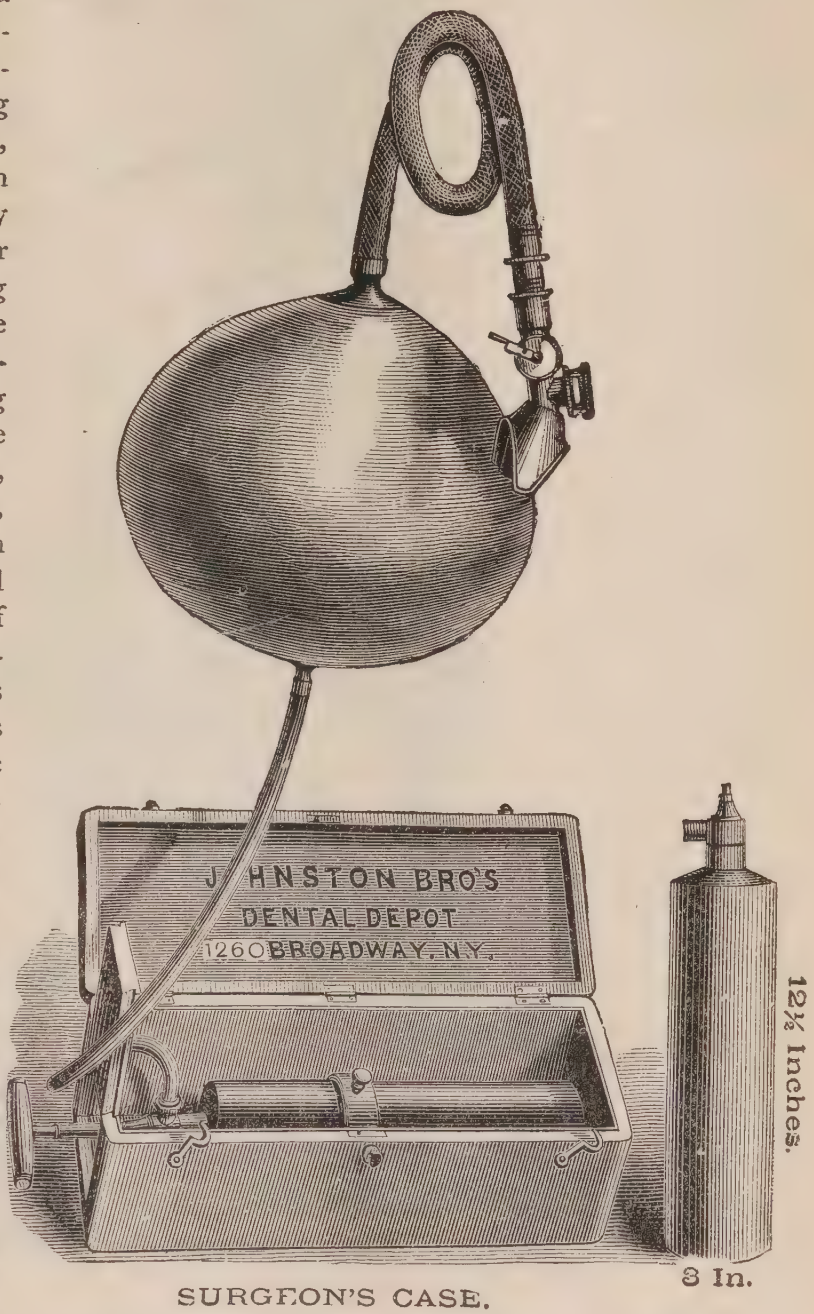
When Nitrous Oxide is given, nothing of this occurs, and the surgeon is in no way conscious of the presence of the anæsthetic, except as he sees its effects on his patient. This, we think, is a convenience to the surgeon.

Numerous and repeated trials of the Liquid Nitrous Oxide in capital operations in surgery, (as well as in momentary operations), during the two years just passed, attest the

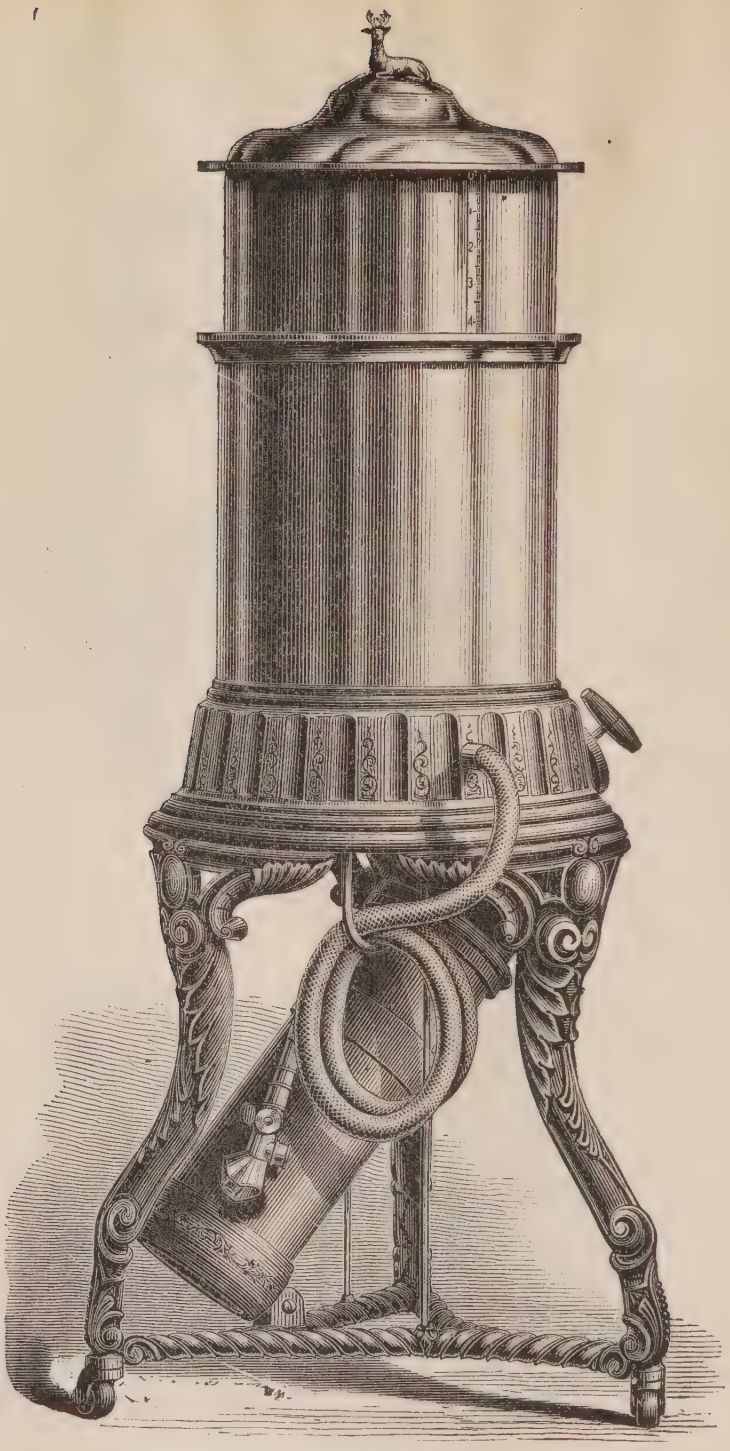
perfect adaptability of this agent to all cases where an anæsthetic is needed, and the time is not very distant when it will supplant its cheaper, but dangerous rivals.

Two styles of apparatus are provided for its administration. The most generally used, because of its cheapness and portability, is the SURGEON'S CASE.

This comprises a strong cylinder containing One Hundred Gallons of Gas; a strong morocco covered case, provided with an iron ring and set screw, by which the iron cylinder is held in place during use, and its delicate valve protected from injury; also, a rubber bag with rubber tube at one end for admission of gas, while an inhaling tube, handsomely covered on its outside, and provided against any possibility of a collapse by a tin-coated spiral of wire on its inside, is fastened at its opposite end; a metallic inhaler—nickled—having two spring valves, which answer to the slightest breath, either of inspiration or exhalation. The inhaler also has a two-way stop-cock or ground valve so arranged, that the gas being shut off, the patient may be allowed to breathe air until all alarm is dissipated, and then, by an unobtrusive movement of the fingers without previous notice, the air may be excluded and gas admitted. It contains also, a nickel-plated wrench and a nickel-plated key. In fact *all* the apparatus necessary for administering the gas. The whole case and contents weighs about fifteen pounds. This is here shown as open, and the bag which receives the gas from the cylinder, and from which it is exhibited to the patient, is represented as filled, and suspended above the case. The cylinder is also shown as standing at the side of the case. This is the simplest and most popular form of apparatus, and will be everywhere welcomed—because of its portability for use outside of the operating room.



SURGEON'S CASE.



NICKEL-PLATED GASOMETER

AND ORNAMENTED STAND

FOR LIQUID NITROUS OXIDE.

NICKEL-PLATED GASOMETER.

This style of apparatus is especially designed for those who use large quantities of Nitrous Oxide, or who may desire a highly ornamental piece of office furniture, coupled with a *really economical* gas apparatus, the gas being furnished in 1,000 gallon cylinders, at a reduction of 25 per cent. in price.

The cut on the opposite page represents the nickel-plated gasometer, mounted on a stand, with a 1,000 gallon cylinder, in position, under the gasometer.

Heretofore, gasometers have been so unsightly, that it has been considered desirable to place them in an adjoining room or behind a screen; we take pleasure now in offering to the profession a gasometer so handsomely gotten up, that it will be an ornament to any office, and at the same time so constructed, as to be vastly superior to any apparatus heretofore used. The gasometer will, when full, hold 10 gallons of gas —this is sufficient to completely anæsthetize any patient. The usual amount of gas given to a patient is from 3 to 5 gallons.

If it is desirable to keep the patient under the influence of the anæsthetic for any length of time, (as in a surgical operation), the operator has under his control 1,000 gallons of gas, by merely turning the key seen in the cut at the right. The gasometer is nickel-plated, highly polished, and mounted on a carved iron stand, which is japanned and ornamented with bronze.

On the bell of the gasometer there is a scale graduated in gallons, and fractions of a gallon, so that the operator can readily see how much gas he has administered.

Another valuable feature in this gasometer, is a peculiar water-check or valve, so arranged that though the gas will flow freely on the lightest inspiration at the inhaler, it is instantly and automatically shut off by the water when the patient stops breathing.

This does away with the necessity of closing any stop-cock, and prevents all waste of gas; it also saves the dentist's time at the most critical moment, as he has only, after having administered the gas, to lay aside the inhaler and proceed at once to operate without the necessity of shutting any stop-cock. The stand is so constructed that a small (100 gallon) cylinder can be used while the large cylinder is being re-filled.

We should also call attention to the fact, that there is no liability to loss of gas from leakage, caused by the operator's leaving the valve of the cylinder open, for if there is such escape from the cylinder, the bell of the gasometer will rise, and the operator will have his attention called to the waste, thus enabling him to correct the difficulty at once.

The whole apparatus is mounted on castors, and can be readily moved.

This apparatus is especially desirable where large quantities of nitrous oxide are used, or where it must be sent a great distance. In this form it is best to ship it by *fast freight*—which makes the cost of transportation very light. The gas can be kept for any length of time, and is constantly on hand *and always of the best quality.*

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.

Why Nitrous Oxide should be preferred to Ether or Chloroform.

1st. It is far safer—see foregoing statistics. Dr. Colton reports having administered it to thousands of patients, without a single accident.

2d. It acts quickly; from one to two minutes being generally sufficient to bring a person completely under its influence.

3d. It seldom excites a patient to violence—a matter of great importance.

4th. Nausea is not often excited, even during a long operation. Eating, however, should not immediately precede the administration of the gas. It is contended by some operators of large experience, that *pure* nitrous oxide *never* causes nausea. In operations of the eye, or in the pelvic region, this peculiarity renders the gas invaluable, and it always is of much value to the patient's feelings.

5th. The shock given to the system by other anæsthetics, is almost as severe as the operation itself, and a slow return to consciousness and the normal condition detrimental to the recovery of the patient. Nitrous Oxide frees itself from the system as speedily as it produces its effects, and so adds nothing to the perils of surgery.

6th. It is no small advantage, as before recited, that, while using Nitrous Oxide, the operator feels no inconvenience from its effects, as he does not inhale it, while he cannot altogether escape the fumes of ether or chloroform.

REVISED PRICES.

Complete Apparatus—Surgeon's Case, with Metallic Inhaler	**No. 1**	$42 00
Complete Apparatus—Surgeon's Case, with extra sized Bag and Metallic Inhaler	**No. 2**	44 00

Boxing either, $1.00.

Each complete apparatus includes a 100 gallon cylinder, filled with Liquid Nitrous Oxide.

Cylinder with 100 gallons of Gas	16 00
Refilling Cylinder	6 00
Nickel-Plated Gasometer, with ornamented iron stand	128 00
Necessary adjuncts, (including Union Nut, Key-Wrench, Inhaler and covered Tubing)	12 00
1000 Gallon Cylinder	36 00

The above cylinder may contain more than one thousand gallons—say from 1000 to 1200 gallons—for which the price will be at the rate of 4½ cents per gallon, which is 25 per cent. less than the price in small cylinders.

Contents, if 1000 gallons would be, at 4½ cents	45 00
Morocco covered case, with ring and thumb screw, velvet lined	12 00
Polished bl'k walnut " " " " "	13 00

Or these latter we have only a limited number.

Rubber Bag, with covered inhaler tubing, (about 4 gall. capacity)	5 00
Rubber Bag, with covered inhaler tubing, extra size	7 00
Inhaler, latest style, with two way stop cock, adapted to the use of both dentists and surgeons, with connection	9 50
Key, Nickel Plated	1 50
Wrench, "	50
Union, Nickel Plated, (nut and tube), for connecting cylinder and gas bag	1 50
Covered Inhaler Tubing, per foot	50
Plated Connection to fit old style Inhaler	1 00

JOHNSTON BROS.,

Broadway, cor. 32d St., N. Y

NITROUS OXIDE GAS.

100 GALLON CYLINDER TRIPOD.

PRICE, $4.00.

We here show a representation of a tripod, handsomely japanned and ornamented, which is designed to hold the cylinder while in use, and is less expensive than the Morocco case, of the Surgeon s case.

Price adapted to		100	gall.	cylinder	.....	$4.00.
"	"	" 500	"	"	.....	6.00.
"	"	" 1000	"	"	.....	8.00.

ADJUNCTS NECESSARY WITH EITHER TRIPOD, VIZ.,

Bag, Inhaler, Key, Union-Nut and Wrench..... .....$17.00

SUSPENSION DENTAL ENGINE.

(INVENTED BY DR. W. S. ELLIOTT.)

The Dental Engine represented in the accompanying plate is confidently recommended by us as sure to give general satisfaction.

Two or three years ago a few engines modeled on this, the Elliott, plan (suspension from the ceiling) were sold. Though imperfectly constructed, they have been uniformly commended by those who have used them.

Each of the two styles of Dental Engines which have found favor with the profession has advantages peculiar to itself.

In this form the driving power is belted directly to the shaft of the hand-piece, without the intervention of a flexible joint, and so *entirely avoids all the unsteadiness* or "chattering" which is almost inseparable from the flexible joint, even when short, and is unendurable where the non-rigid portion is long.

The Remodeled Engine, shown in our cut, has not only greater elegance of design than the Suspension Engine as previously sold, but, by its construction, obviates several objections to which the earlier model was liable. It was previously necessary to make the hand-piece large and heavy in order to give tension to the belt, and in furtherance of this purpose a considerable ball of metal was suspended from the rear of the hand-piece. As now made, the ball weight is dispensed with, the hand-piece being balanced and tension given to the driving-belt by placing a small pulley on the hand-piece spindle. The hand-piece is reduced to half its original weight, *and the slightest movement at its point can now be felt by the hand which guides it.* Among its advantages, those subjoined are prominent.

1st. It is more steady in its movement than any Engine made.

2d. Being suspended on a cord, it is free to move in any and every direction—hence the bur can be readily applied to any cavity, whatever may be its position in the mouth.

3d. It has an abundance of power.

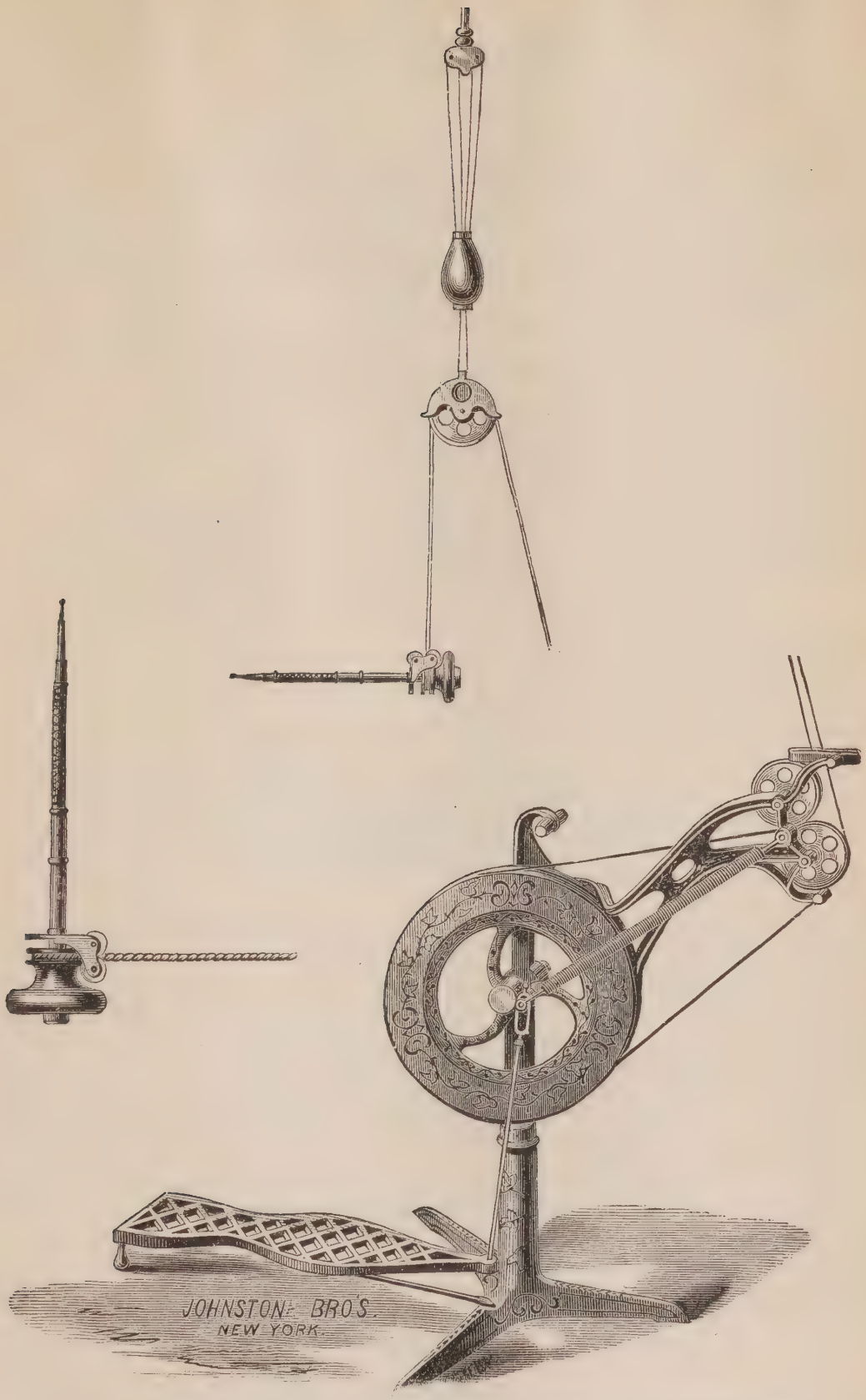
4th. It is not easily broken or likely to need repairs.

5th. It is, above all others, a "*light running*" Engine.

6th. The hand-piece, which formerly was particularly objectionable because of its size and weight, and because of the position occupied by the weight needed to balance it, is now scarcely larger than that of the Morrison Engine, and is fitted to use the same (C style) bur. For the balance-weight we have substituted *a fly-wheel on the shaft which carries the bur.* While keeping the hand-piece well balanced, this gives momentum and greatly increased steadiness to the cutting instrument.

Orders for this Engine will be entered in rotation as received, and promptly filled.

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.



SUSPENSION DENTAL ENGINE.

(Dr. ELLIOTT'S INVENTION.)

Price. $50.00 Right Angle Attachment, $5.00. Boxing, $1.00.

New York College of Dentistry.

1878-79.

FACULTY.

FANEUIL D. WEISSE, M. D., Professor of Regional Anatomy and Oral Surgery.

FRANK ABBOTT, M. D., Professor of Operative Dentistry and Dental Therapeutics.

ALEX. W. STEIN, M. D., Professor of Visceral Anatomy, Physiology and Histology.

F. LEROY SATTERLEE, M. D., Ph. D., Professor of Chemistry, Materia Medica and Therapeutics.

J. BOND LITTIG, D. D. S., Professor of Mechanical Dentistry and Dental Metallurgy.

CLINICAL FACULTY.

WILLIAM H. ALLEN, Clinical Professor of Operative Dentistry.

JOHN ALLEN, D. D. S., Clinical Professor of Mechanical Dentistry.

JOHN T. METCALF, Clinical Professor of Operative Dentistry.

WM. T. LAROCHE, D. D. S., Clinical Professor of Operative Dentistry.

BERTRAND J. PERRY, D. D. S., Clinical Professor of Operative Dentistry.

FRANK M. ODELL, D. D. S., M. D., Clinical Professor of Operative Dentistry.

FACULTY LECTURERS.

D. W. WILLIAMSON, D. D. S., Lecturer on Operative Dentistry.

A. RUST CUYLER, D. D. S., Lecturer on Mechanical Dentistry.

C. F. W. BODECKER, D. D. S., Lecturer on Dental Histology.

EBEN M. FLAGG, D. D. S., Lecturer on Mechanical Dentistry.

JOHN SEYMOUR CLARK, M.D., Lecturer on Chemistry, Materia Medica and Therapeutics.

Demonstrators.	*Assistant Demonstrators.*
D. W. WILLIAMSON, D.D.S.	JOHN C. MILLER, D.D.S.
A. RUST CUYLER, D.D.S.	GEORGE J. HARTUNG, D.D.S.
S. FRANK JOHNSON, D.D.S.	JULIUS M. STEBBINS, D.D.S.
GEORDE M. EDDY, D.D.S.	

Students may matriculate at any time, as the Infirmary is open for regular students of the College to practice in the entire year.

The regular course of Lectures will commence on Tuesday, October 1st, and continue until the latter part of February. Three hours of each day of the week (except Saturday) will be devoted to Lectures, and four hours to *Clinics*, and practice at the Chair and in the Laboratory, under the direction of the Demonstrators.

The Infirmary is furnished with twenty-four good chairs and all the appliances. The Lecture-room will seat, and the Laboratory accommodate, two hundred students ; all on one floor, and up one flight of stairs only. There is seldom any lack of patients for students to operate upon.

Tickets for one year's Instruction, including Course of Lectures, Matriculation, Demonstrators', Diploma Fees, and practice in the Infirmary the seven and one-half months between the sessions....	**$150.00**
For the Course of Lectures only	100.00
Matriculation	5.00
Graduation Fees	30.00

Board may be obtained for from $6 to $8 per week.

For further information, address

FRANK ABBOTT, M. D., Dean.

22 West Fortieth Street, New York.

JOHNSTON ADJUSTABLE FOUNTAIN SPITTOON.

The defects of the Fountain Spittoons hitherto made are, that it is almost impossible to keep them from leaking, and that they occupy a rigid position close to the left of the chair, and hence prevent the operator from working on that side.

These defects will not be found in this spittoon, which is commended to the favor of Dentists by the following points of merit:

1st. It is readily adjustable to the position of the chair; that is, it can by an easy movement of the hand be raised or lowered to suit the height at which the chair is placed at the moment.

2d. The normal position of its base is, say, eighteen inches to the left side of the chair, from which position its basin will ordinarily be inclined towards the chair and patient; but should the operator desire to stand on that side of his patient, the standard of the spittoon can be instantly inclined in the opposite direction, so as to be entirely out of the way

3d. Instead of a wooden case, twelve inches square, is an ornamented metal tube one and a half inches in diameter, which will not warp, occupies very little room.

4th. Movable joints are so arranged that any leakage is impossible, since the waste from the bowl never comes to the joint itself, but is discharged below, in the bottom of the lower half of the socket of the globe, and conveyed into the waste pipes.

5th. It is provided with a gold trap, and an operator of good practice now using the ordinary spittoon will be able to save enough gold in from one to two years to entirely reimburse himself for this purchase.

6th. All its bright parts are of gun metal, and its tubing silk covered.

The water jet used is the device of Dr. Redman, of Louisville, Ky.

Price. $60.00
Boxing..... 2.00

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.

Ohio College of Dental Surgery,

COLLEGE STREET, CINCINNATI.

THE THIRTY-THIRD ANNUAL SESSION—1878-9.

Faculty.

JAMES TAYLOR, M. D., D. D. S.
Principles and Practice, and Dental Hygiene.

WM. CLENDENNIN, M. D.
Anatomy.

J. S. CASSIDY, M. D. D. D. S.
Chemistry and Materia Medica.

J. L. CILLEY, M. D.
Physiology and Histology.

A. O. RAWLS, D. D. S.
Pathology and Therapeutics.

H. A. SMITH, D. D. S,
Clinical Dentistry.

J. R. CLAYTON, D. D. S.
Mechanical Dentistry and Microscopy.

Special Professors:

F. H. REHWINKEL, M. D., D. D. S.
Oral Surgery.

G. W. KEELY, D. D. S.
Cause and Management of Irregularities of the Teeth.

C. I. KEELY, D. D. S.
Demonstrator of Operative Dentistry.

S. WARDELL, D. D. S.
Demonstrator of Carving Teeth.

FRANK BELL, D. D S
Demonstrator of Continuous Gum Work.

ALEX BROWN, D. D. S.
Assistant to Chair of Chemistry.

E. G. BETTY, D. D. S., Demonstrator of Anatomy.

Clinical Instructors:

DR. S. B. BROWN,
DR. F. A. HUNTER,
DR. A. W. SMITH,
DR. D. W. CLANCEY,
DR. J. E. CRAVENS,
DR. J. K. JAMISON,
DR. J. I. TAYLOR,
DR. F. PEABODY,
DR C. R. TAFT,
DR A. F. EMMINGER,
DR. W. S. HOW.

This institution being strictly a *Dental College*, the lectures in all the branches taught, Anatomy, Physiology, Pathology, Therapeutics, and Materia Medica included, are arranged with the view to qualify the student to intelligently and successfully practice his profession.

The College Building was designed, erected, and is exclusively used for a Dental School. The lecture and clinical rooms are therefore well adapted for the uses to which they are put.

Terms of Graduation:

A candidate for graduation must be twenty-one years of age. He must have attended two courses of lectures in a Dental or Medical College, the last of which must be in this institution. A reputable dentist in actual practice five years, inclusive of the term of pupilage, may be examined for the degree of D. D. S., after attending one full course of lectures.

Fees:

Matriculation Fee (but once)	$5 00
Professor's Tickets for one session	75 00
Demonstrator's Ticket (for Anatomy)	5 00
Diploma Fee	20 00

It is desirable that the students should matriculate and be in attendance promptly at the beginning of the term. The term begins the 1st of November, and continues sixteen weeks.

Students coming to the city should call on the Dean. Good board can be had for $3.00 to $5.00 per week. For further information, address

H. A. SMITH, DEAN,
286 RACE STREET, CINCINNATI.

Philadelphia Dental College,

Nos. 108 & 110 N. Tenth St., above Arch.

SIXTEENTH ANNUAL SESSION, '78-'79.

Faculty.

HENRY MORTON, A. M., Ph. D., Emeritus Professor of Chemistry.
C. A. KINGSBURY, M.D., D.D.S., Emeritus Professor of Dental Histology and Operative Surgery.
J. H. McQUILLEN, M.D., D.D.S., Professor of Physiology and Dental Histology.
D. D. SMITH, M.D , D.D.S., Professor of Mechanical Dentistry and Metallurgy
S. B. HOWELL, M.D., Professor of Chemistry and Materia Medica.
T. C. STELLWAGEN, M.D., D.D.S., Professor of Operative Dentistry and Dental Pathology.
JAS. E. GARRETSON, M.D., D.D.S., Professor of Anatomy and Surgery.
HENRY I. DORR, D.D.S., Adjunct Professor of Practical Dentistry.

F. M. DIXON, Lecturer on Operative Dentistry.
EDWARD L. HEWIT, D.D.S., Demonstrator of Operative Dentistry.
ALONZO BOICE, D.D.S., Demonstrator of Mechanical Dentistry.
ARTHUR R. GAGE, D.D.S., Assistant Demonstrator.
FRANK EYRE, M.D., Ph.D., D.D.S., Demonstrator of Chemistry and Materia Medica.
M. H. CRYER, M.D , D.D.S., Demonstrator of Anatomy.
L. ASHLEY FAUGHT, D.D.S., Demonstrator of Physiology and Dental Histology.

Clinical Instructors.

J. FOSTER FLAGG, D.D.S.
C. A. KINGSBURY, M.D , D.D.S.
WILLIAM C. HEAD, D.D.S.
JAMES McMANUS, D.D.S.
H. C. REGISTER, M.D., D.D.S.
M. H. CRYER, M.D., D.D.S,
C. E. FRANCIS, D.D.S.

WARREN R. MILLARD, D.D.S.
J. L. EISENBREY, D.D.S.
JAMES MARTIN, D.D.S.
W. J. POTTER, D.D.S.
G. B. McDONALD, D.D.S.
GEORGE G. CARDWELL, D.D.S.
JOSEPH P. WYMAN, D.D.S.

J. L. BAKER, D.D.S.

Graduation.—Two years' study, attendance upon two sessions of the *regular winter courses of lectures* and examination at the end of second course are required for graduation. Attendance on one *regular winter course* in any other respectable Dental or Medical College will be regarded as equivalent to one course in the Philadelphia Dental College.

Graduation in Medicine.—Arrangements have been made with the Jefferson Medical College by which the students of the Philadelphia Dental College can obtain the two degrees of D.D.S. and M.D. in *three years.* Students desiring to graduate in medicine must notify the Dean of their intention at the beginning of their second course.

The Dispensary and Laboratory *are open all the year*, and the instruction of the student in *Practical Dentistry* has ever been a prominent feature of the institution ; seven hours can be daily spent in actual practice, under the supervision of the *Adjunct Professor of Practical Dentistry, who will give his entire attention during that time to his duties, aided by competent Demonstrators.* The Dispensary consists of two large rooms, each fifty feet in length (lighted on all sides by twenty windows and a fine sky-light), furnished with forty comfortable operating-chairs, arranged to command the best light, and affording excellent opportunities for practice to the students. A large number of patients present themselves at the clinics.

The Spring Course of Lectures will commence on the first Monday of April, and continue until the last of June, Fall Preliminary Lectures, commencing Monday, September 2d, will continue daily until October. The Regular Winter Course commences Tuesday, October 1st, and closes on the last day of February ensuing.

Fees.—Tickets for the Course, including the Demonstrators, $100 ; Matriculation (paid but once), $5 ; Diploma, $30 ; Board $4 to $6 per week. For further particulars, address

J. H. McQUILLEN, Dean, 1713 Arch Street.

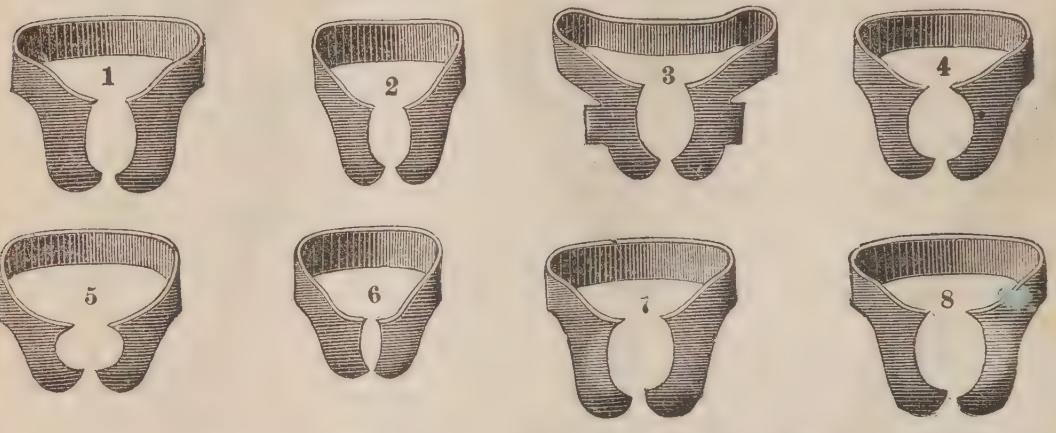
We were never more sure of doing signal service to the Dental Profession than now in offering the

IMPROVED

Rubber Dam Clamps,

INVENTION OF

DR. DELOS PALMER, OF NEW YORK.



Price, set of Eight, { Oil finish, $4.00. Each plain, 50 Cents
Nickel plated, 4.80. " Nickeled, 60

For use with Rubber Dam Clamp Forceps.

These Clamps are designed to be placed on the tooth at the commencement of the operation. Afterwards apply the Rubber Dam by passing it over both tooth and clamp.

DESCRIPTION.

Nos. 1 and 2.—Universal Clamp for Molars.

No. 3.—For posterior cavities in molars standing alone.

No. 4.—For third molars, or any molar of a cone shape. This Clamp can oftentimes be turned around while on the tooth, so as to place the bow of the Clamp out of the way of the operator.

No. 5.—For biscuspids.

No. 6.—For lateral and central incisors.

Nos. 7 and 8.—RIGHTS AND LEFTS.—For cavities under the gum, on the buccal or lingual surface of molars.

Cuts of two favorite styles of Rubber Dam Clamp Forceps will be found on another page.

These Clamps have prominent points of marked superiority over those of other manufacturers.

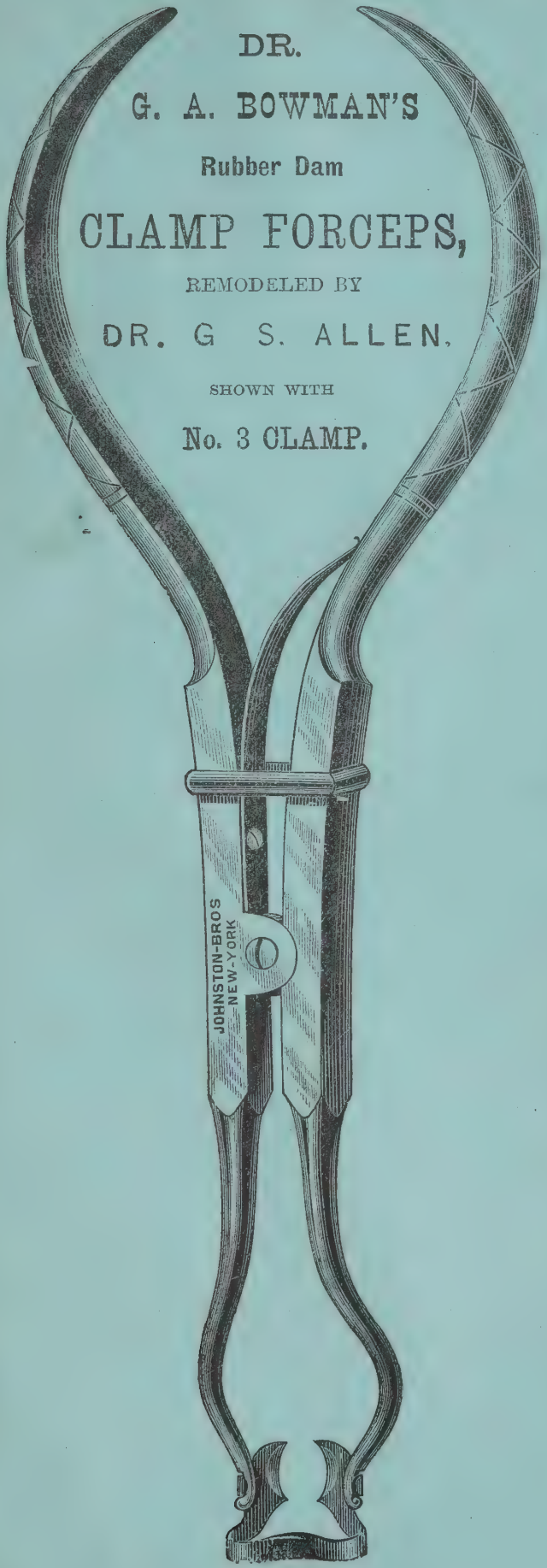
First. Each has been carefully adapted to the shape of the tooth for which it is designed, *under the personal supervision of Dr. Delos Palmer*, the inventor.

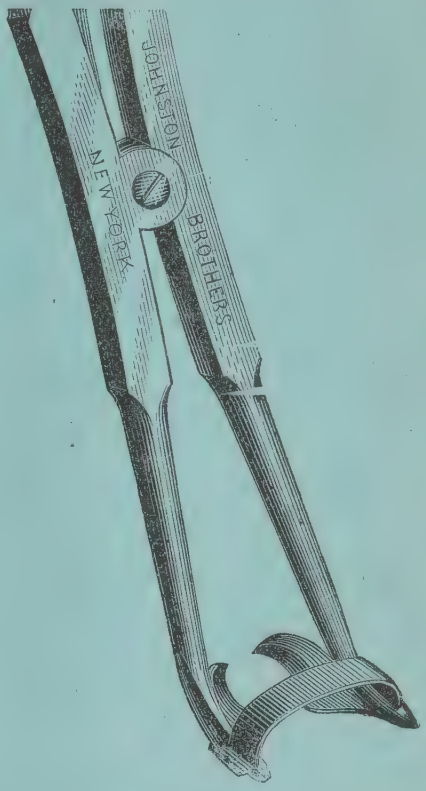
Second. A groove is made by us in the clamp, into which the forceps nicely fit, so that the clamps firmly hold their position on the forceps, when once adjusted, instead of tilting from one position to another—as is the case when no groove is provided.

JOHNSTON BROS., Broadway, cor. 32d Street, N. Y.

RUBBER DAM CLAMP FORCEPS.

Of these we offer two styles, both deservedly popular.





POINTS OF DR. T. C. ROYCE'S

Rubber Dam Clamp Forceps,

Shown with Clamp. Handles are exactly like the other style, (Bowman's.)

Both styles of these Forceps have points accurately adapted to the shape of the clamp at the neck, and hence will be found much more convenient than those hitherto offered the profession in this point of adaptation. (See also advertisement of Clamps.)

If so ordered we can supply either style of Forceps with a band, which will keep the Forceps and Clamp extended and ready for use when the hand of the operator is removed, as shown on the Bowman Forceps.

PRICES.

Forceps, either style	$3.00
" " " Nickel Plated	3.50
Complete set of Clamps, embracing eight forms	4.00
Complete set of Clamps, embracing eight forms, plated	4.80
Clamps, each	50
" plated	60

JOHNSTON BROS.

Broadway, cor. 32d St., N. Y.

1879.

JOHNSTONS'

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